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DIESEL RAILWAY TRACTION SUPPLEMENT

The September issue of the THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 1s.

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

T.U.C. and Industry

ACCORDING to press statements the General Council of the Trades Union Congress has been considering a report on the post-war reconstruction of industry, which embraces the draft of a plan for the public ownership of a number of primary undertakings. This plan envisages first of all public ownership of such industrial undertakings as fuel and power, including coal, gas, and electricity, and also most forms of internal transport; its supporters contend that public opinion, backed by wartime experience, is prepared for the transfer to the State of the coal mines and railways. As to the means by which nationalisation will be exercised, it is believed that the plan provides for the establishment of an economic advisory committee at the highest administrative level, with industrial boards at the industrial level. High on the list of priorities for subsequent control is said to be the iron and steel industry. These proposals are to be the subject of special reports by the Council to the postponed annual Trades Union Congress, which is due to open at Blackpool on October 16.

A Bad Example

Such constant advocacy by certain sections in this country of national ownership cannot fail to have unfortunate results overseas. It is, perhaps, hardly logical to advocate State ownership of industries which are already controlled by our own nationals, and, at the same time, to take exception to proposals by overseas governments to nationalise similar industries, which are the property of capital foreign to that country. One of the most recent of these developments has been the decision of the Anglo-Egyptian Sudan Government not to renew the concession of Sudan Plantations Limited, which has among its assets a railway and a canal. Mr. S. W. Alexander in *The Evening Standard* points out that the campaign for nationalisation and public control of utilities in Great Britain is undoubtedly one of the causes of similar development in other countries. He thinks that it is time that this folly was recognised and also the fact that there is no inevitable process towards a new form of business-controlling organisation. He suggests that the Government should get out of business, and reduce taxes so that the businessman, by his enterprise, may secure more resources for the country as a whole. This viewpoint is sound, but it will be very difficult to divorce our bureaucrats from the strongpoints which they have established during the past five years.

Argentine Railways and Wage Retentions

It is reported from Buenos Aires that the members of the local railway committee have interviewed President Farrell and the Minister for Public Works, and have presented a memorandum setting out the legal and economic reasons for not depositing the sum which was called for by the National Railway Office. As was explained in our August 4 issue, the National Railway Office had called for a deposit corresponding to the retentions which, it claimed, had been unduly effected on railway workers' wages. The amount of the deposit was first given as 64,206,0000 pesos (about £3,800,000), but more recent messages refer to 24,206,000 pesos (about £1,500,000). Sir Montague Eddy has left London for Buenos Aires, and it is stated that negotiations are proceeding with a view to effecting a compromise. It is believed that Sir Montague Eddy will discuss other matters affecting the railways, as well as the claim by the National Railway Office. Meantime, a *communiqué* has been issued from the Argentine President's office stating that the Cabinet has approved a declaration that in no case will Argentine or foreign capital be expropriated except by negotiation or through legal channels, and that all reports about unilateral procedure must be considered as without foundation.

Private Railway Operation and the Taxpayer

The current issue of the timetable folder published by the Missouri Pacific Lines contains a striking statement over the signature of Mr. L. W. Baldwin, Chief Executive Officer of the Missouri Pacific Railroad Company, pointing out how private operation of U.S.A. railways in the present war is doing a great deal to lighten the load of all other taxpayers. This he demonstrates by comparing the amount of taxes paid into the Federal Treasury by the railways during the present war, with the sums paid out of the Federal Treasury as a result of Government operation of the railways during the previous war. When the U.S.A. Government took over the operation of the railways in 1917, it guaranteed their owners the same average annual net operating income as had been earned in the three financial years ended on June 30, 1917. Because of conditions resulting from 26 months of operation of the railways by the Government, the guarantee period was extended six months beyond the date of their return to their owners. Although passenger and goods rates had been increased by Government order, Federal operation

of the railways resulted in a loss, and the deficit in the net operating income for the 32 months which the American taxpayers had to defray amounted to $1,600,000,000. In the 32 months made up of the calendar years 1942 and 1943, and the last 8 months of 1941, the U.S.A. railways operating under private management helped to finance the present war through the payment of Federal taxes to the extent of $2,290,000,000, which, added to the amount the Government paid out of the Federal Treasury for its operation of the railways just over a quarter of a century ago, is regarded by Mr. Baldwin as representing a saving of nearly four thousand million dollars, a figure which he has no doubt will exceed five thousand million dollars by the end of the present year.

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Overseas Railway Traffics

Some revival has taken place recently in the prices of some of the ordinary and debenture stocks of British-owned railways in Argentina and receipts have continued to expand on the four larger systems. Increases in the sixth and seventh weeks of the current financial years have been £76,920 on the Buenos Ayres & Pacific, £74,196 on the Central Argentine, £43,080 on the Buenos Ayres Great Southern, and £22,680 on the Buenos Ayres Western. For the corresponding fortnight in 1943 the Great Southern had an increase of £15,540, and the Central Argentine one of £13,740, but the Buenos Ayres & Pacific was £10,500 down. The recent decreases shown by the Central Uruguay go against increases recorded a year ago, and in contrast with the present aggregate improvement of only £4,931 for the seven weeks of the current financial year, may be set an advance of £66,808 in the corresponding period of 1943.

	No. of week	Weekly traffics	Inc. or dec.	Aggregate traffic	Inc. or dec.
		£	£	£	£
Buenos Ayres & Pacific*	7th	114,720	+37,800	790,380	+203,460
Buenos Ayres Great Southern* ...	7th	151,440	+ 7,980	1,172,520	+162,300
Buenos Ayres Western*	7th	58,320	+ 13,500	427,860	+88,620
Central Argentine*	7th	162,132	+31,602	1,196,754	+296,784
Canadian Pacific	32nd	1,212,400	+28,200	38,773,000	+3,881,400

* Pesos converted at 16⅔ to £

Recent substantial traffic increases on the Great Western of Brazil and the Leopoldina Railways follow on the great advances in receipts shown in the previous year, but they must continue to be discounted largely by the growth of costs.

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The Right of Reply

In recent weeks on more than one occasion our attention has been called to the fact that in the daily press statements have appeared to which exception has been taken by an interested party, but endeavour to secure publication of a reply has been unavailing. In the matter of editorial comment, every editor retains the inviolate right of the expression of his opinion and of the furtherance, by argument, of the policy of his paper. With this we are not so much concerned, but it is desirable that where statements of fact, or statistics, are challenged, more especially by those directly associated with the matters to which reference is made, opportunity should be afforded for a reply. This surely is one of the functions of the correspondence columns of a newspaper. On the other hand we are only too well aware of the difficulty of dealing with the great volume of correspondence which reaches a newspaper office every day, much of it so irresponsible, or so wordy as to preclude the possibility of publication, particularly in these days of paper shortage.

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U.S.A. Exports to South America

As from September 1 United States exporters no longer will require to obtain statements of cargo available and priorities to the South American States, with the exception of Argentina. This means, in effect, that the United States exporters will now be able to deal directly with steamship companies for cargo space without priorities from the U.S. War Shipping Administration, and this will be another step towards expediting shipments generally, and the restoration of business to commercial channels through relaxation of Government controls. Unfortunately, Great Britain is not yet in a position to make a similar move, and it may well be that the British manufacturer as a result will be further handicapped in regaining overseas markets after the war. Because this country must import, not only its raw materials but much of its food, it must have a large export trade. It is essential that the controlling authorities should give every consideration and assistance to the re-expansion of our exports at the earliest possible moment. At present, our potentialities in this direction are limited by our pledges in connection with Lease-Lend materials, by military shipping requirements, and by the demand made on materials and productive capacity for war purposes.

Some Practical Steps

There is no reason, even at this stage, why the plans which have been discussed for some time between the export groups of many of our industries and the Board of Trade should not be brought into final shape, so that they can be put into operation at short notice. The Export Credit machinery also needs to be overhauled, and the necessary extensions which have been envisaged should be put into practical form so that the trader may know what assistance he may expect to obtain from this source. Moreover, the necessary authority for obtaining raw materials and the use of labour should be forthcoming, as in the United States, as soon as progress towards victory permits service contracts to be replaced by others for export. The relaxation of trading which has been made in the United States relates to South American countries in which Great Britain in 1938 sold over £16,000,000 worth of goods, excluding £19,000,000 to the Argentine, which does not come within the present arrangement. The implications are sufficiently grave to merit early attention by those concerned with the post-war export position of Great Britain.

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Preparing for After the War

It is becoming increasingly plain that, despite all the planning which is taking place, the amount of actual preparation for post-war trading and commercial development is distressingly small. One instance of this lack of prevision attained prominence recently when Lord Brabazon drew attention to the failure of the Government to make any plans for British civil aviation after the war. It is well known, of course, that the American aviation industry is preparing energetically for post-war development. In *The Daily Mail* of August 28, a leading article suggested that all Government departments should be reminded that "there is a peace coming" and added that the idea that "there is a war on" has become such an obsession in the mind of some ministers that they constantly put it forward as a reason for not doing anything to prepare for peace. With so great a number of our bureaucracy comfortably ensconced in wartime jobs, which all but they hope will end soon after hostilities, there is a great danger of a new vested interest arising—that of a continuation of wartime conditions even after fighting is finished.

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Bakerloo Line Permanent Way Renewals

The closing of the Bakerloo Line from August 14 until August 25 for the renewal of track foundations and the modernisation of the permanent way in the tunnels under the Thames, is described on page 211 of this issue. It was not possible for this heavy work to be undertaken during the few hours at night when the line is closed for ordinary repairs, because of the large quantity of new and old material which would need to be handled. Further, this section of line is sealed off by floodgates during an air raid alert and the men who volunteer to carry out repairs when the floodgates are closed find conditions very bad. It was decided, therefore, to close this section of railway by the introduction of temporary diaphragms south of Waterloo and to leave the floodgates south of Charing Cross and north of Waterloo open to permit the circulation of fresh air by means of an exhaust fan at Waterloo. The cost of the work, which was carried out by some 500 men working in three shifts, will be approximately £5,000. Apart from the special tube problems of access and working space, one of the chief difficulties which the engineers have had to overcome has been the removal of the bottom armour plate and concrete bedding from under the track, together with the fitting of corbel plates to suppoot the inner lining of arched armour plate which still covers the sides and top of the tube tunnels over the sections where the track has been relaid.

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Systematic Salvage of Bridge Material

On the Erie Railroad of the United States an important factor in bridge maintenance, especially in conditions of wartime material shortage, is the bridge shop of this company at Port Jervis, New York State. This shop has been in existence for some years, and is completely equipped to fabricate any steel that may be required in maintaining or strengthening existing bridges. Since the United States became involved in the war, this equipment has proved readily adaptable to large-scale reclamation and reworking of steel from old bridges; it is estimated that 40 per cent. of the steel required in the company's present bridge programme consists of material so reclaimed (chiefly from abandoned lines), and fabricated in the Port Jervis shop. Originally the plant was housed in box wagons, but in 1926 a beginning was made with the provision of more permanent accommodation. In 1928, an extensive bridge-strengthening programme was inaugurated, to prepare the main line from Jersey City to Marion, Ohio, for the use of heavier locomotives,

and it was decided to extend the Port Jervis plant. A similar programme between Marion and Hammond, Indiana, was afterwards taken in hand and was finished in 1943. Some particulars of the Port Jervis plant are given on page 220.

Electronics in Railway Service

The prominent part that is likely to be played in post-war railway operation by radio communication is receiving close study in the United States at the present time. On its Belvidere branch, between Trenton and Phillipsburg, as described in detail on p. 591 of the June 9 issue of *The Railway Gazette*, complete dispatcher-to-train and train-to-train communication has now been brought into operation by the Pennsylvania Railroad. The Chicago, Rock Island & Pacific Railway has prepared a programme of study and experiment in the use of radar and similar electronic devices for train communication and control, and plans to develop a form of short-wave radio communication, first between the front and rear ends of trains and between yard offices and shunting crews, and later between dispatchers in line-side control offices and the crews of trains in motion, similar to the Pennsylvania method. At the same time attention is being given to the possible applications of radar, particularly in the realm of safety measures, in which it is felt that far-reaching results might be achieved towards the safer and more efficient working of the trains. To direct these investigations, an Electronics Engineer has been appointed by the Chicago, Rock Island & Pacific, and a similar step has been taken by the Illinois Central System. The latter's research will be co-ordinated with the findings of the Radio Technical Planning Board, of which the Association of American Railroads is one of the sponsors.

The Cost of Obsolescence

Statistics published recently concerning American locomotive power witness both to the remarkable improvement that has been effected in the efficiency of locomotive working and maintenance, and to the doubtful wisdom of maintaining in service obsolete or obsolescent locomotives. On a certain railway, locomotive repairs have not varied more than 3 cents, or 12 per cent., a locomotive mile, for 20 years. In that period the average annual locomotive mileage has increased from 22,100 to 37,800 miles, by 3,000 locomotives of all types in use, and an average tractive force increased by 15 per cent. has added more than proportionately to trainloads and average speeds. Whereas in 1921 the maximum annual mileages of locomotives did not greatly exceed the average figure, by 1941 the same railway had in service a considerable number of locomotives averaging 180,000 miles annually, and by 1944 engines of still later design, on various railways, are averaging more than 250,000 miles a year. Even such figures as these are overshadowed by modern diesel-electric power, which has given annual mileages as high as 390,000 per locomotive—as compared with the 22,100-mile average of 1941. Further, whereas steam locomotive mileages between heavy repairs have increased from an average of 26,000 in 1941 to over 100,000 today, on many American lines locomotives of the latest types are running mileages up to 300,000 between complete overhauls. These considerable differences between maximum and average figures, so strongly in favour of up-to-date design, suggest that a bold policy in the scrapping of obsolescent power may be the soundest economic policy in the end.

An Interesting L.N.E.R. Locomotive Conversion

One of the most useful—and certainly one of the best known—of all the types designed by Mr. J. G. Robinson for the Great Central Railway figures in a recent L.N.E.R. locomotive conversion, some details of which appear on p. 212. Here a numerous class was involved, and it was felt that by providing a boiler of up-to-date pattern, to avoid replacements of the 33-year-old original design, a more efficient and powerful machine would be obtained. At the same time, to ensure economical use of the steam generated by the new boiler, the fitting of fresh cylinders with improved steam distribution was included as part of the conversion. A radical departure from the original design thus has been achieved; the principal alterations in external appearance are the larger boiler, with round-topped firebox, and the addition of the Walschaerts gear, which has necessitated the raising of the running platform. The new L.N.E.R. standard cylinders have the piston valves above, instead of between them, giving a shorter passage to the steam. With the new standard boiler and cylinders, these engines appear to have received a timely augmentation in power, which should not only assure them of a much extended period of usefulness, but should also prove to be of immediate value, in view of the shortage of locomotive power which now exists and which is likely to persist in this country for several years.

Multiple-Aspect Signals on the S.I.R.

THE development of signalling on the Indian railways has taken a course somewhat different, in certain important respects, from that followed in the British Isles, not only as to the actual design of the equipment, but also in respect of the signal aspects and meanings, block working and operating rules, and those small but often influential details which count for so much in certain circumstances. The subject has brought forth many papers and articles and even to-day, to judge from the very interesting discussions appearing from time to time in the *Quarterly Technical Bulletin*, there is sufficient difference of opinion among signalling and operating officials in India to ensure that no meeting convened by them need ever be dull. Among the points at issue, probably the most discussed of recent years has been that of the advantages or disadvantages of the long-established "B" class working, which uses a stop signal, unannounced in any way, as the first signal protecting a station. The outer signal may have under it, and very frequently does, a warner or distant arm, which, when cleared, is a sort of express or run through signal.

There is a certain amount of "A" class working, where there is no outer and the signalling resembles that seen in England, with substantially similar block rules, but the "B" class working is more generally met with. Even those who feel constrained to criticise it, admit that it has served India well and it is not surprising that any proposals tending to call its efficacy in question should awaken authoritative voices in its defence. These criticisms are not primarily concerned with the block regulations involved in "B" class working, as these might be retained while altering the signal aspects used with them. The main point at issue and brought into such prominence of recent years is whether it is satisfactory to have a stop signal which must be read from afar by the driver of a high-speed train, or whether a caution signal at full braking distance ought to be provided. The latter is the usual practice on most railways, and of comparatively recent years there was only one principal European main line, the former Paris Orleans Railway, that still had the equivalent of the Indian outer. We never had the advantage of observing the working on that line, but assume that long views of the signals must have been obtainable and that fog was seldom met with. The use of caution signals in rear of signals placed as far from the lever as an outer presented some difficulty, unless power was resorted to, until the adoption of well-constructed double-wire apparatus. With this to their hands the advocates of distant signals for outers felt encouraged to proceed and on the then Assam-Bengal Railway the idea was brought to fruition in combination with multiple-aspects and speed signalling. On some parts of the railway curves and liability to fog gave rise to a wish to introduce something of the kind.

The same system of signalling was adopted later by the South Indian Railway and on page 210 we publish a description of the arrangements adopted sent to us by Major C. A. White, I.E., who has taken a considerable part in the discussions in India, alluded to above, and is himself strongly in favour of the adoption of the multiple-aspect principle generally, in which his railway now officially concurs. The meanings of the various aspects and the working of the stations will be clear from the article; there is a slight difference from the layout adopted on the former Assam-Bengal system, as the latter includes track circuiting in the main and loop lines, and substitutes the proving of the loop clear for isolation by trap points. There is also, as will be seen from the account of the work on the Assam-Bengal, published in our issue for August 29, 1941, a certain amount of difference as to the mechanical details; the S.I.R. uses separate detector levers instead of detectors in the transmissions, and uses levers pulled in succession for both outer and distant signals, instead of for the latter only. The means employed to hold the road are also different.

The S.I.R. has both metre- and broad-gauge sections and is making trials with the new signalling on both, but only on the former are the complete layouts shown on our diagram to be found at present. On the broad gauge the loops are not isolated by trap points and there is a permanent speed limit of 30 m.p.h., as prescribed by Government regulations. Starting signals are dispensed with and the outer signals work to 45 deg., or caution, only, but we presume that there is a possibility of such stations being altered to the more complete arrangement seen on the metre gauge. A feature of the S.I.R. work is the use of approach warning boards in rear of the distant signals. This is an arrangement that has proved very satisfactory on the Continent, in more than one country, although there it is more usual to have two or three boards with the last from 140 ft. to 300 ft. or so in rear of the distant, and there is, it may be mentioned, some

difference of opinion as to what is the most effective form of board for attracting attention. In addition to this mechanical 3-position signalling—for as semaphores are employed we can use the old familiar term—the S.I.R. has some multiple-aspect light signalling and is extending the fundamental principles involved in both as opportunity offers. The operating staff, the drivers leading, are, we are told, most satisfied with this policy and that is something which must always be given great weight by those responsible for recommending any divergence from established methods.

The Rating of Railways*

RATING law in England and Wales dates from the Poor Relief Act, 1601. The Parochial Assessments Act of 1836 provided that the rate upon rateable hereditaments in each parish should be based upon their net annual value, *i.e.*, on the rent at which they might reasonably be expected to let from year to year . . . . deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses necessary to maintain them in a state to command such rent. Substantially the same language was used in the Parochial Assessment Act, 1862, and in the Valuation of Property (Metropolis) Act, 1869, with regard to London. In the assessment of great public utility undertakings such as railways, waterworks, gasworks, and the like, the operations of which might stretch far beyond the limits of any individual parish, the Courts were compelled to evolve a system of calculation which involved a number of very difficult assumptions, but which became recognised as the standard method. In the case of a railway, the undertaking was divided into the portions regarded as directly productive of profit, such as the permanent way, and the portions regarded as only indirectly productive, such as stations. The latter were usually valued by taking the cost of erection and allowing a percentage on that cost. This method was commonly described as the "contractor's basis." For assessing the rateable value of the permanent way the method commonly known as the "profits basis" was adopted.

To apply the profits basis, the calculation began by ascertaining the gross receipts earned in the parish for the latest period before the date of the rate. From these gross receipts was deducted a proper proportion of the working expenses throughout the system, and a deduction had further to be made for the portion allocated to the parish of rent hypothetically paid for the use of stations and other indirectly productive assets, and for the rates payable thereon. The amount remaining after these deductions from the gross receipts earned in the parish was taken as the net profit divisible between the owner and the hypothetical tenant. Since the hypothetical tenant was rateable only in respect of hereditaments which he was supposed to occupy, it was necessary to make a fair deduction for the use of his personalty and stock-in-trade. The method adopted was to estimate the amount of capital required to work the whole system, to calculate a fair proportion of this amount as being fairly allocated to the particular parish, and to allow the deduction of a certain percentage on the capital so ascertained from the amount of the divisible net profit. The percentage was fixed at a sum considered to be sufficient to give the tenant interest on his money and a fair return on his capital for the risks undertaken and by way of profit on his adventure. The portion of the net profits which remained after this deduction was regarded as the rent which the hypothetical tenant would be prepared to pay, deducting the Statutory allowances thereon to arrive at the true rateable value.

Many Standards of Assessment

This method had many disadvantages. It involved calculations in parochial sections by many assessment committees at different times and on various data. The largest area subject to a single tribunal of appeal was a county, so that the standards of assessment applied to a single railway company might be as many as there were Quarter Sessions for the areas containing its undertaking. In many parishes the customary method of valuation gave negative values, but nevertheless nominal assessments were imposed and, as no abatement in the heavily assessed parishes was allowed for the nominal assessments, it followed that the sum of the assessments exceeded the value calculated as a whole. This system, which contained no machinery—such as had existed in Scotland since 1854—for valuing each railway undertaking as a whole, continued for England and Wales until the Railways (Valuation for Rating) Act, 1930, came into operation on April 1, 1931.

During the Government control of the railways from 1914 to 1921 no material change took place in the rating position of the companies, and on the grouping under the Railways Act, 1921, it was agreed to be impracticable to work the old machinery. Accordingly it was agreed with the local authorities that until legislation set up new machinery there should be a yearly adjustment of the rateable values broadly in proportion to the rise and fall of net receipts. This arrangement continued in force until March 31, 1931. Under it the net annual value of the four group companies taken together amounted to £10,340,000, namely L.M.S.R. £3,600,000, L.N.E.R. £2,600,000, G.W.R. £2,300,000, and Southern Railway £1,840,000. In 1913 some 120 companies which were subsequently amalgamated with or absorbed by the four groups paid a total of approximately £4,990,000 in rates, and the amounts paid by the individual groups into which they were formed were: L.M.S.R. £1,855,000, L.N.E.R. £1,440,000; G.W.R. £945,000; and Southern Railway £750,000.

On April 1, 1931, the Railways (Valuation for Rating) Act, 1930, came into force. This Statute re-enacted the principle contained in the Parochial Assessments Act, 1836, and the Rating & Valuation Act, 1925, and the annual value to a yearly tenant was thus applied to all classes of rateable property. It made Statutory net receipts the basis of the valuation of railways; and set up a new authority called the Railway Assessment Authority consisting of a chairman and nine other members. The duty of the Authority is to make quinquennial valuations of each railway as a whole, the first valuation to come into force on April 1, 1931, the second on April 1, 1936, and so on. The main difference created by the Act of 1930 has been that the value of the undertaking must be ascertained "as a whole" and then apportioned, instead of the attempt being made to ascertain the earning capacity of the railway in each parish, as was done previously. Under the new method the distinction between the directly and indirectly productive parts of the undertaking becomes necessary only in conection with the apportionment of the total *cumulo* value.

Apportionment of *Cumulo* Value

The apportionment of the *cumulo* value (the valuation of the railway as a whole) is made under a scheme sanctioned by the Minister of Health. This value is apportioned to each hereditament or part of the undertaking of a company on a just estimate of the relative value which the hereditament or part has to the undertaking as a whole. To this end the undertaking is first divided into four parts:—(*a*) the principal undertaking (that is, broadly, the railway proper); (*b*) each canal undertaking; (*c*) each dock undertaking; and (*d*) each subsidiary undertaking. All these are called "constituent undertakings."

The first stage of apportionment is to divide the *cumulo* value among the several constituent undertakings in proportion to the estimated relative value of each such undertaking to the undertaking of the company as a whole. The net annual value of each constituent undertaking is then to be apportioned among the hereditaments thereof in proportion to the estimated relative values of those hereditaments to that constituent undertaking.

For apportioning the total net annual value allotted to the principal undertaking its hereditaments are subdivided into:—(i) Class A, comprising all the hereditaments consisting of "Land used only as a railway made under the powers of any Act of Parliament for public conveyance"; (ii) Class B, comprising all other hereditaments of the principal undertaking.

The block of net annual value allocated to Class A as a whole is further sub-divided between the "traffic element" and the "non-traffic element." The reason for this is that, in hereditaments consisting of "land used only as a railway," there are parts (*e.g.*, portions of platforms and other areas) over which no traffic is conveyed and as to which therefore volume or value of traffic affords no criterion of relative value. The traffic element of net annual value is allocated among the hereditaments of Class A in accordance with a just estimate of the gross receipts from traffic attributable to each such hereditament; these are estimated from the gross receipts attributable to convenient sections of line. The non-traffic element is allocated among the hereditaments of Class A in accordance with the relative value of each of them to the principal undertaking *otherwise than* from the gross receipts from traffic. The amount of net annual value allocated to Class B as a whole is divided among the hereditaments of that class in accordance with the relative value of each of them to the principal undertaking.

Basis of First Valuation

The basis of the first valuation was the average net receipts for 1928 and 1929 and that of the second valuation the average net receipts for 1930-1934 inclusive. The first valuation of the four companies by the Railway Assessment Authority and inserted in the draft valuation roll aggregated £13,550,000, made up of L.M.S.R. £5,000,000, L.N.E.R. £3,500,000, G.W.R. £2,800,000, and Southern Railway £2,250,000. The valuation of the Southern Railway was the first to be completed, and the figure of £2,180,000 was inserted in the completed roll. In

* Reprinted, with some corrections and amendments, from *The Railway Gazette*, June 2, 1944

framing it the Railway Assessment Authority did not adopt the "profits basis," and relied mainly on the language of Section 4 (2) of the Act of 1930 which provided that in estimating the rateable value as a whole the Authority should not be bound to give effect to any custom or practice affecting the valuation of railway hereditaments which obtained before the passing of the Act in regard to the deduction or allowance to be made in respect of the capital of a tenant, but should have regard to all material considerations with a view to securing that the estimated rent represents a fair and just division of the net receipts as between the landlord and the tenant. This subsection figured prominently in the appeals to the Railway & Canal Commission and subsequently to the House of Lords when the first valuation made by the Authority in respect of the Southern Railway was challenged by that company. Both Courts held that the direction to assess the rent by reference to the net receipts in accordance with the subsection of the Act could be achieved only by a proper application of what is called the profits basis, *i.e.*, based upon the three factors: (1) the tenant's capital, (2) the percentage to be allowed to him on that capital, and (3) the yearly net receipts to be earned by the tenant from the undertaking.

The Railway & Canal Commission, however, reduced the estimated value of the tenant's capital by making a deduction for obsolescence and disallowing the former practice of adding to the cost of rolling stock manufactured by the company a percentage to represent manufacturer's profit, and a further addition which the company had made based upon the reduction of cost effected by mass production. In the result the Railway Assessment Authority's valuation of the Southern Railway was reduced from £2,180,000 to £1,077,131.

The valuation of the Southern Railway by the Railway & Canal Commission was arrived at as follows:—

	£	£	£
Average net receipts 1928-29			5,408,000
Tenant's capital	27,610,697		
15 per cent. thereon		4,141,603	
Receipts earned without employment of tenant's rolling stock :—			
(A) Pullman cars	559,048		
(B) Trains of Metropolitan District and London Midland & Scottish to Richmond & Wimbledon	91,362		
(C) Owners' wagons estimated at	1,000,000		
(D) "Rents from houses and lands" and "other rents"	242,258		
	£1,892,668		
Tenant's share, 10 per cent.		189,266	
Occupier's share or non-rateable profits of trade			4,330,869
Net annual value			£1,077,131

After the House of Lords' judgment and its confirmation of the valuation previously found by the Railway & Canal Commission, negotiations ensued with the other main-line companies, and the following net annual values were agreed for the First and Second Rolls.—

	1st Roll (1931-1936)	2nd Roll (1936-1941)
	£	£
S.R.	1,077,131 (Court)	1,150,000
G.W.R.	1,650,000	1,400,000
L.M.S.R.	1,750,000	1,500,000
L.N.E.R.	1,100,000	1,100,000
	5,577,131	5,150,000

In respect of the Third Roll period operating from April 1, 1941, and related to the net receipts for the five years ended December 31, 1939, the railway companies represented that the Second Roll figures should be continued for the Third Roll period. The increase in the net receipts was more than offset by the increase in the value of the tenant's capital, a detailed valuation of which during the war period presented insuperable difficulties. The Railway Assessment Authority was not able to agree to this proposal but eventually the following net annual values were agreed between the Authority and the main-line companies:—

S.R.	1,339,806
G.W.R.	1,631,068
L.M.S.R.	1,747,573
L.N.E.R.	1,281,553
	6,000,000

At the end of 1943, however, the only part of the Third Roll which had been completed was in respect of the Southern Railway.

The accompanying table shows the variations in net annual value in certain selected years. The figures for 1930 were arrived at under the provisional arrangements agreed with the local authorities, and the latter figures explain tehemselves; thousands are omitted.

—	1930	Railways (Valuation for Rating) Act, 1930			
		Draft Valuation Roll	First Valuation Roll 1931-36	Second Valuation Roll 1936-41	* Third Valuation Roll 1941-46
	£	£	£	£	£
L.M.S.R.	3,600	5,000	1,750	1,500	1,748
L.N.E.R.	2,600	3,500	1,100	1,100	1,281
G.W.R.	2,300	2,800	1,650	1,400	1,631
S.R.	1,840	2,250	1,077	1,150	1,340
	10,340	13,550	5,577	5,150	6,000

* Subject to completion

The Railways of Japan

A CRITICAL survey of the war situation in the vast Pacific zone leads to the conclusion that the impact of hostilities on the main Japanese islands may be expected very much sooner than was at one time hoped, and the restrained optimism of Mr. Churchill in his recent realistic Survey, regarding the war against Japan, appeared to lend great weight to such a view. Accordingly, we publish this week (pages 218 and 219) a revised map of the railways of Japan, comprising the main island of Honshu, and the neighbouring islands of Shikoku, Kyushu, and Hokkaido, together with the southern or Japanese part of Sakhalin Island, called Karafuto. In Japan, railways do not occupy the same important place in the wartime economy of the country that they do in the territories of the other principal belligerents. Goods conveyance by rail has never been so important in Japan as in continental countries, mainly because of the facilities afforded by coastal shipping, and railway dislocation by air attack would have less far-reaching consequences than in many other countries. Nevertheless, the Japanese railways have been geared to the war machine to an increasing extent within recent months, and have been required to tackle new and heavy goods-transport tasks to relieve the shipping tonnage previously available for traffic between the various Japanese islands, and on coastal service, which has been reduced to establish new communications between Japan and her occupied territories in the South, as well as to provide transport services for the Armed Forces. Coal is now carried almost wholly by railway, whereas before the war it was handled nearly entirely by shipping.

The first project for a railway in Japan dates back to 1869, but, as the Treasury was then in no position to cover the outlay, a loan for a million sterling was floated in London. Construction was begun in 1870, and the section from Tokyo to Yokohama was opened in September, 1872. Lines round Osaka and Kobo were completed in 1877, and the 372-mile Tokaido route from Tokyo to Kobe was completed in 1899. Other Government lines had been built meanwhile, but private enterprise was responsible for the construction of some 1,150 miles of line between 1881 and 1891. In the latter year a Railway Construction Law was promulgated for the purpose of mapping out a comprehensive system. The importance of railways in relation to war requirements was not recognesed until the war with Russia in 1904, and a result of that conflict was the nationalisation of most of the Japanese main-line railways. By the Railway Nationalisation Law of 1906 the Government took over the 17 leading private companies, and thereby became responsible for all the principal railways in Japan. The present route length of the Imperial Government Railways of Japan is about 11,500 miles, of which some 655 miles are electrified. Most of the system is single track, and all is on the gauge of 3 ft. 6 in. which was adopted in 1870. In July, 1925, all rolling stock, both passenger and goods (including some 5,000 vehicles belonging to private railway companies), was equipped with automatic couplings. This gigantic work had involved five years of preparation and trials; the Government met half the expenditure of the private companies. The speed of conversion, and the lack of effective opposition on financial grounds, are reminders of the fact that Japan was the first of the modern totalitarian countries.

It would appear that railway construction during the past 10 years has not exceeded 270 route miles, made up mainly of links between isolated sections, for the earlier structure of the system was broadly that of local distribution lines from the ports, and the long rail haul of goods has always been avoided. These links have assisted in the recent fundamental change of policy which is converting a railway system designed primarily for passenger

(principally tourist) traffic, into a goods carrier. Other new lines are designed to serve additional ports, and to provide land links with coal mines, manganese and silicium deposits, and so forth. Principal interest attaches to the new submarine tunnel between Shimonoseki and Moji, linking the islands of Honshu and Kyushu. In October of last year, the old-established Ministry of Traffic (formed in 1885, and dealing mainly with shipping, was merged with the Ministry of Railways (formed in 1920) to constitute a Ministry of Transport with wide powers, comparable with the British Ministry of War Transport, to co-ordinate all forms of communication in the interests of the war. Since then railway passenger traffic has been discouraged by fare increases and transport taxes, as well as a system of Police permits for journeys exceeding 62 miles, from April 1; from the same date, fast trains, first-class accommodation, dining cars, and sleeping cars were withdrawn; preference is given to goods transport and the evacuation of large cities; the railway industry has been given the status of a key industry; strenuous efforts have been made to even-out seasonal peak traffics; and rolling-stock production has been standardised and controlled.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Free Wheels for Rolling Stock

8, Comiston Rise,
Edinburgh, 10. August 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Arising out of his remarks on this subject, Mr. H. G. Ivatt states categorically that coned tyres tend to keep the flanges clear of the rail. There is only one natural path which a pair of wheels on an axle can take and that is at right angles to the axis. On curved track, therefore, nothing but forcible restraint can prevent contact between the outer flange and the rail. On straight track there is abundant evidence of side wear on rails, sometimes severe and generally alternating first on one rail and then on the other.

So far from Mr. Ivatt's principle being established, it is arguable that the coning is responsible, each wheel in turn overrunning the other. It is by no means impossible that the beneficial effect of coning is one of those plausible hypotheses which have become accepted through habit without sufficient empirical proof.

Yours faithfully,
REGINALD PETERS

L.N.E.R. Services out of Marylebone

17, Buckingham Road,
Aylesbury. July 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—On completion of the present scheme for the widening to four tracks of the L.N.E.R. line between Harrow-on-the-Hill and Rickmansworth, and the electrification of the line between Rickmansworth and Amersham and Chesham, it is suggested that the following further improvements be undertaken:—

1. Electrification on the third and fourth rail system of the line between Amersham and Aylesbury.

2. Construction of all-steel multiple unit electric trains L.N.E.R. and L.P.T.B. Joint stock for the working of the line.

3. Electrification on the 1,500 volt overhead d.c. system of the L.N.E.R. line from Marylebone to South Ruislip, and the G.W.R. line from Paddington to South Ruislip both *via* Park Royal and *via* West Ealing, together with the G.W. & G.C. joint line on to Princes Risborough and Aylesbury.

4. Construction by the L.N.E.R. and the G.W.R. of mixed-traffic electric locomotives for working both passenger and goods traffic over these lines together with all-steel multiple unit trains for working the local services from Marylebone and Paddington.

5. Construction at Princes Risborough of a new joint motive-power depot to accommodate both electric and steam locomotives of both companies, as it is suggested that all trains be electrically hauled between London and Princes Risborough, where the change over from electric to steam haulage would take place.

6. Opportunity should also be taken to reconstruct certain of the stations on the G.W. & G.C. joint line, such as Denham Golf Club, Seer Green, West Wycombe, and Saunderton with fast lines between the platform loops.

7. Doubling and electrification of the branch from Princes Risborough to Aylesbury, and the reconstruction of the stations either as island platforms or double platform structures.

In consequence of these suggested improvements, the following alterations to the train services would be necessary:—

All main-line trains from Marylebone would be diverted to the High Wycombe route, and give connections at Princes Risborough (where they would all have to stop to change over from electric to steam haulage) for Aylesbury.

The direct service between London and Aylesbury should operate from and to Baker Street only, and should run non-stop between Baker Street, Harrow and Rickmansworth. The local passenger service between Marylebone and Aylesbury would be withdrawn, and the section of the present main line between Neasden South Junction and Harrow-on-the-Hill would no longer be required for passenger traffic.

A local steam service should be inaugurated between Aylesbury and Brackley and Princes Risborough and Brackley in place of the present through trains from and to London; passengers from stations on these lines would change at either Aylesbury or Princes Risborough for London.

These schemes are prompted by the rapid expansion of Aylesbury as an industrial town, which since the outbreak of war has increased enormously in population, so much so that I think that a return to the peacetime train services would be impossible. A half-hourly service would be required throughout the day and it would, therefore, be difficult to find paths for expresses over this route. Moreover, by these schemes the two distinct systems of electric traction would be kept separate by the diversion of Marylebone traffic to the Wycombe route and this would avoid the inevitable conversion sooner or later of one system to the other with the growth of this form of traction on our main-lines generally, which whenever it takes place will, no doubt, prove to be a most costly business.

Yours faithfully,
GEORGE SNOWDON

A Fighting Fund for Freedom

1, Dover Street, London, W.1. August 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—We are fighting this war for eternal values, for Christian principles, for liberty and freedom and for the soul of man; for freedom to lead our own lives, for freedom from State interference, for freedom from filling up endless forms and from dictation and direction by Government officials, and for freedom from the continuance of State control after the war. We have *lent* our personal freedom to the Government for the duration—it is vital that the loan be repaid after the war is over.

Today the trend of post-war legislation is in the opposite direction. Bill after Bill is being introduced, or envisaged, which involves compulsion and loss of personal freedom. Something must be done now to arrest the race down the road to the totalitarian state. The further we go down that road the harder it will be to turn back.

The mortal danger is fully explained in Dr. Hayek's book, "The Road to Serfdom," dedicated to "the Socialists of all Parties." "Some of the forces which have destroyed freedom in Germany are also at work here."

In a democracy the people have the last word. It is to the people, the millions of individual men and women of all classes, to whom we make this most earnest appeal. Have we fought this war to preserve our freedom from foreign tyranny in order to lose our liberties to the bureaucrats at home? If we are to survive after the war, constitutional principles must be applied, not in the sectional but in the national interest.

We therefore ask all freedom-loving men and women to send £1 (more if they can) towards a fighting fund to enable us, by creating a public opinion, to make an immediate effort to express on their behalf a demand for the minimum of State control and the maximum of individual freedom, and to ensure that constitutional principles shall be pursued as soon as the war is over.

We shall do what we can directly, to secure this end, but we shall also make grants to existing organisations of proved worth, such as the Economic League, the Women's Guild of Empire, the Society of Individualists, and the National League for Freedom. We know well the value of their work, literature and speakers, but their activities are limited by the money at their disposal. Help with election expenses will also be given to Parliamentary candidates who are pledged to uphold, in their own way, the principles for which we stand.

Our bankers are the Midland Bank, and our accounts will be open to any subscriber. We promise that any money sent to us will be wisely and well spent in the cause of liberty and freedom The matter is urgent. We want £1,000,000. It is not a great sum compared with the issues at stake.

In the 1935 Election about 10,000,000 electors voted for the Constitutional cause. Is it too much to ask that one in every ten of them should send £1 to work for a free Great Britain?

Please send your subscription quickly to:—The Honorary Secretary, Fighting Fund for Freedom, 1, Dover Street, Piccadilly, London. Progress will be reported from time to time in the press.

If a people will not save themselves, no Government can.

Your obedient Servants,

ABINGDON	ERNEST CAIN	F. ROBERTS
GEORGE AYLWEN	CLANWILLIAM	D. L. SAVORY
DESMOND J. G. BEALE-BROWNE, BRIG.-GENL.	GLASGOW	WALDRON SMITHERS
	J. THEODORE GODDARD	STANHOPE
	HUBERT GOUGH	H. W. STYLES
F. HAMILTON BENN	ALFRED KNOX	ROBERT TASKER
L. HAMILTON BENN	E. GRAHAM LITTLE	D. M. TOUCHE
J. G. BRAITHWAITE	CHARLES MARSTON	G. WHEATLEY
HYDE C. BURTON, F.C.A.	P. M. MILLER	PRICE WOOD
	F. M. MILNE	

Cylinder Wear

C.M. & E.E. Department, L.M.S.R.,
Nelson Street, Derby. August 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the very interesting letter from Mr. R. S. York, which appeared in your July 28 issue, it is noted that the writer does not state the position of the valve gear at which engines are allowed to coast on the New South Wales Railways. It will be found that if an engine coasts with the valve gear at about 40 per cent. cut-off, then neither pressure nor vacuum is produced in the steam chest, without the introduction of any steam through a drifting valve or "cracked" regulator.

Hence, if it is the practice to introduce a small amount of steam to produce atmospheric pressure in the steam chest, it would appear that the engines are allowed to coast with a somewhat later cut-off than 40 per cent., and it would have been interesting to have been told what this position is.

Mr. York no doubt is correct in stating that carbonisation can be overcome by destroying the vacuum in the cylinders, thus preventing hot gases and ash from being drawn down the blast pipe. This, however, cannot be done merely by ensuring atmospheric pressure in the steam chest, due to the fact that the pressure in the cylinder falls during the interval between cut-off and the point where the valve opens to exhaust. To ensure atmospheric pressure in the cylinder at the point where the valve opens to exhaust, it would be necessary to have a pressure in the cylinder of about 12 lb. by gauge at the point of cut-off, assuming the valve gear is in the 50 per cent. cut-off position. Hence it would be necessary to admit sufficient steam through the drifting valve to raise the pressure in the steam chest to at least 15 lb. by gauge.

Under these conditions there would be a certain amount of work developed in the cylinders, but not enough to overcome the resistance of the engine. Thus, although the engine would run very freely, it would not exert any pull on the train. I would suggest, therefore, that if drivers were instructed to maintain 15 lb. pressure on the drifting gauge still better results would be obtained.

Yours faithfully,
D. W. SANFORD

Railway Electrification Pros and Cons

Essex. August 21

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Would you kindly allow me another word on this subject. Writing in your August 18 issue, Mr. O. S. Nock assumes that you take responsibility for the statement from "a well-informed source" that there would be little difference in speed on electrified lines. I hope this is not so. In the case of passenger trains speed undoubtedly would be increased. What would passengers to East Anglia not give to be rid of the slow start up Bethnal Green incline and then, later on, the crawl up Brentwood Bank, apart from the saving of time in stopping and starting at each station?

In the case of goods trains, faster movement would be possible whether the train was composed (wholly or partially) of braked vehicles or of loose-coupled wagons. The electric locomotive again scores in starting and stopping and in running over lines with steep gradients. The number of fitted merchandise vehicles, as you will know, has been increased from 10 to 20 per cent. of the total stock between 1931 and 1938, but, so far as I am aware, there has never been any proposal for introducing fitted mineral wagons. Yet the London & North Eastern Railway is half way towards the conversion of their Manchester and Sheffield section, largely used for coal and coke traffic. The justification of that scheme will surely turn on the fact that electric locomotives will get the traffic over the Pennines quicker than the steam engines can and so increase the capacity of the route. Perhaps you will be kind enough to clear up the point.

Coming to Mr. Ashley Brown's letter of August 17, in this country we cannot make a comparison between the actual performance of steam and electric locomotives. To test the standard of mobility of steam and electric machines we are compelled to take electric motor vehicles, and I selected the Southern Railway figures because its electrification has passed far beyond the stage of running intensive suburban passenger services. By 1938 the Southern had electrified 622 route miles out of a total of 2,156. In that year electric motor vehicles ran 58 per cent. of their coaching train mileage—37,300,000 train miles against 26,500,000 by steam. The electric motors were in traffic 1,818,000 hours, the coaching train locomotives for 1,709,000 hours. Both the electric motors and the coaching locomotives were in traffic for rather over 12 hours a day on weekdays. The coaching-train miles per hour for electric motors were 20·5 and for locomotives 11·3. These facts prove the efficiency of the electric motor and confirm the deduction from the more general locomotive statistics previously used, which are weighted down by the inclusion of goods and mineral engines, but are boosted by covering the long-distance express and high-speed passenger trains of all companies.

The second part of Mr. Ashley Brown's letter is written as though one had advocated electrification on a wholesale scale and had asserted that traffic would come as a matter of course. The phrases used were "a prudent scheme of conversion" and "a judicious policy of electrification." Clearly each scheme must be examined on its merits and turned down if it won't pay. The main thing is that our railways should not be too late once again in making a forward move.

Yours faithfully,
EAST ANGLIAN

Mr. Ashton Davies

London & North Eastern Railway,
Hamilton House, 155, Bishopsgate,
London, E.C.2. August 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—As Mr. Bell says in his letter appearing in your issue of August 25, the editorial recently published by *The Railway Gazette* will have given great pleasure to the many friends of Mr. Ashton Davies, particularly the younger generation who are so indebted to him for guidance in managing the heritage which he and other eminent railwaymen have handed down to them.

But perhaps I may be permitted, also "in the interests of historical accuracy" as Mr. Bell puts it, to point out that long before 1932 one other railway company, in addition to the old North Eastern, charged one man with the responsibility of public contact and securing business for a railway, for in the year 1915 the board of the old Great Eastern Railway, then under the management of Sir Henry Thornton, placed Mr. T. W. Watts in charge of all goods and passenger business with the title of "Commercial Superintendent." Mr. Watts was also made responsible for the mineral side.

Whether in making this change in organisation the Great Eastern took a lead from the North Eastern I cannot say.

Yours faithfully,
L. H. K. NEIL,
London City Manager

Speed on the Bengal-Assam Railway

Crathes Castle,
Aberdeen. August 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Page 169 of *The Railway Gazette* of August 18 announces a rumour to the effect that the U.S.A. authorities working the railway from Katihar to Dibrugarh in Assam have raised the speed limit from 25 m.p.h. to 40 m.p.h. I know nothing as to what restrictions may have been imposed since the outbreak of war, but as it reads the paragraph seems a little unkind to the old Eastern Bengal State Railway, which formerly administered the section from Katihar to the river crossing at Amingaon, some 300 odd miles. According to pre-war working timetables, the maximum permissible speed was 43-35 m.p.h., there being long stretches at the former figure. The Assam Mail, a creditable train by metre-gauge standards, covered the 174¾ miles from Amingaon to Lalmanirhat in 6 hr. 5 min. with seven regular stops (occupying 44 min.) and five conditional ones. Automatic tablet exchange apparatus was provided at crossing places.

Yours faithfully,
J. G. BURNETT OF LEYS

[As our reference indicated, the speed-limit increase is an American claim. It was made without further details being given, as it not surprising in view of the military importance of this line of communication to the Burma Front. We assumed that it referred to portions of the former Assam-Bengal Railway and/or the Dibru-Sadiya Railway.—ED. *R.G.*]

The Scrap Heap

MAHOMET AND THE MOUNTAIN

A novel method of labour-saving has been discovered at Maryport, Cumberland. When the 8.17 a.m. passenger train arrives from Carlisle, into which there is some loading of fish to be done, the train is pulled up twice, if not three times, so that the van doors may be opposite the barrows. This use of steam power saves the movement of the barrows to the vans, and the train, of course, is always moving in the right direction.

* * *

FIG LEAVES FOR THE HALLE ORCHESTRA

Two railway wagons were dispatched from Manchester, one bearing the label "Leamington Spa" and the other marked "Bath." Somehow they became mixed, with the result that a touring revue got the Halle Orchestra's instruments and the Halle Orchestra got the revue's "props."

First the members of Mr. Morval's touring revue company at Bath, who expected to collect the scenery and costumes for "Fig Leaves and Apple Sauce," came through to tell the railway that a vanload of musical instruments was of no use to them.

Similarly, at Leamington, the Halle Orchestra said they could not give a concert with somebody else's theatrical scenery and costumes. So the Halle Orchestra had to cancel its concert.

At Bath the proprietor of the Palace Theatre cancelled the two advertised performances of "Fig Leaves and Apple Sauce."

Now—after much frantic telephoning—the railway has got things straight again. And the show goes on.—*From "The Evening News."*

* * *

HIGHER EDUCATION

"How far is it to London?"

"Sixty miles," replied the girl clerk. "But it is much less by express train," she added helpfully.—*From "Laughs Along the Lines."*

* * *

THE PARIS "METRO"

There is an amazing difference between the Paris "Metro" and the London Underground. There is something intimately personal about the one, whereas the other, with its moving staircases, its marvellous elevators and its glittering efficiency, has something horribly robot-like about it—a quality which, I should imagine, is shared by the subways of New York. The Paris "Metro" is not, or, at any rate, it certainly was not, particularly efficient; but probably for that very reason, I always loved it.—*From "An Irishman's Diary" in "The Irish Times."*

Floral effect of Burst Boiler

The effects of an Allied air attack on a locomotive in France; the protruding boiler tubes give a peculiarly floral impression

GUNPOWDER

In the event of any packages of gunpowder or other dangerous articles being left at any station, they must be immediately placed in safety and covered up with a secure tarpaulin or cover.

GIVING TIME TO DRIVER

The guards are provided with timepieces; it is their duty to inform the engineman of the hour at every chief station or junction.

REVERSING LEVER

When stopping the engine, the use of the reversing lever ought as much as possible to be avoided; it may sometimes be placed in the middle position (in which the valves do not act), but it should never be completely reversed, unless absolutely necessary for the stoppage of the train.

AVOIDING VALVES BLOWING OFF

Whenever an engine is standing the spare steam must be turned into the tender, so as to allow as little as possible to escape by the safety-valves.

DRIVER TO WORK IN SHOP

If an engine-driver or fireman is not required for his full time on the line, he is to employ the remainder of his time in the shop, under the shop rules, and at any work the foreman may give him.

STOPPING THE TRAIN

As a general rule, it may be considered that if anything is the matter with the engine, requiring to stop, the quicker it is done the better; but if any of the intermediate parts of the train are off the rails, the allowing the carriages to stop of themselves has, in some cases, kept up a disabled carriage when, it is probable, if the break had been applied in front, the carriages behind would have forced themselves over the disabled one. If, however, the disabled carriage should be the last, or nearly the last, in the train, the break in front may be applied with advantage. . . . In all cases the application of breaks behind the disabled carriages will be attended with the greatest advantage and safety.

(*Extract from the Rules & Regulations of the Belfast & Northern Counties Railway in* 1861).

* * *

The total mileage of railways in the United States on June 30, 1893, was 176,461, being an increase during the year of 4,898 miles. The corresponding increase during the previous year was 3,161, from which it appears that there was some revival in railway construction during the year covered by the report.—*From the "Scientific American" of July,* 1894.

* * *

TAILPIECE

(*Shortage of transport is being blamed for the beer shortage*)

"Roll out the barrel!"
Is heard from near and far,
For beer is greatly in demand
To quench the thirst of war.

Beer is not flowing,
O sad and heavy tidings,
And railway companies are blamed
For keeping it in sidings.

Townsmen and villagers,
The Fighting Forces, too,
The workers in the factories
Must go without their brew.

Blame not the railways
For inn's unopened door.
The reason for the shortage is
That folk are drinking more.

W. E. N.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Facing a Railway Deficit

The Minister of Transport, Mr. F. C. Sturrock, stating railway policy in Parliament recently, said that the way to face a deficit was not to talk about retrenchment or curtailment or even increased charges, unless such steps were unavoidable. What should be done was to encourage trade and traffic. Only in that way were the South African Railways able to face a period when expenditure and revenue did not balance.

They would, of course, have to increase rates, Mr. Sturrock continued. That, he thought, was inevitable in some directions, and they might have to curtail certain discounts which had been allowed. The railways still were working on the 1939 basis of charges; after five years of war that was rather an achievement, considering what had been accomplished. After the war the rates equalisation fund would have been built up to £10,000,000—there had been only £3,000,000 in it when he had become Minister.

Staff Expenditure

Mr. Sturrock said that the railways were paying a cost-of-living allowance to employees at the rate of £5,500,000 a year, and had increased the pay and allowances of lower-paid staff, both European and non-European, at a cost of £1,700,000 a year. They had made other improvements, and at present the question of a general revision of working hours and of conditions under which railwaymen worked was being considered. The superannuation fund had been built up steadily by special contributions of nearly £500,000 a year towards the deficiency in the fund; in 1942-43 an extra £500,000 had been contributed.

Despite the many unavoidable increases in expenditure, they had increased neither rates nor charges. One or two old rates might have been modified, but in effect there had been no increases. The railways represented probably, the only business concern in South Africa, if not in the world, still trading on the 1939 basis of charges. The railways were entitled to a little credit for that financial picture, Mr. Sturrock added.

VICTORIA

Re-railing a 60-ton Crane

On a 7-ft. embankment near Berrybank Station a broken rail resulted in the derailment recently of a number of wagons. After some progress had been made with re-railing operations, the foundation for the packing of the 60-ton wrecking crane failed, with the result that the crane overturned and slid down the bank. To deal with this situation, a breakdown train with a 60-ton and a 30-ton wrecking crane was dispatched to the scene.

Due to its high centre of gravity and its weight of approximately 90 tons, the lifting and re-railing of the overturned crane presented unusual difficulties. It was lifted first to rail level still in the overturned position, and was packed with sleepers, to hold it while the tackle was adjusted for turning the crane right way up.

Hauling to Upright Position

The most difficult operation was that of hauling the crane into an upright position. As there were no trees in the vicinity which could be used as anchors, beams were sunk into the ground, and cables were placed around them and led through pulleys so that the tractive power of two locomotives could be applied to the crane. Although, through the arrangement of the pulleys, the pull of the engines had been multiplied by three, they had to exert their maximum tractive effort to bring the crane into its upright position.

During the long job, which was carried out in exceptionally bad weather and involved difficulties calling for much resource and ingenuity, Rolling Stock and Way & Works personnel of the Victorian Government Railways worked as a perfect team; and the Commissioners of Railways were so impressed that they addressed a personal letter of thanks to every person concerned.

Loudspeakers Installed in Bendigo Goods Yards

Bendigo goods yard has been equipped with loudspeakers, by means of which the yard foreman can direct from his office the movements of wagons. Members of the staff in the yard desiring to speak to him can, in their turn, readily confer with the yard foreman. The last-named can visit any part of the yard, and, by using a convenient telephone, can direct operations by means of the loudspeakers, a facility which also enables Bendigo Control to reach him at any time anywhere in the yard. The system, which has proved successful in the Melbourne goods yards, is to be introduced shortly at Ararat, and ultimately at Ballarat and Geelong. Loudspeakers on passenger platforms, which have proved valuable at Flinders Street, Spencer Street, and Ballarat Stations, have been introduced also at Bendigo Station.

UNITED STATES

Railway Radio Tests

The Denver & Rio Grande Western Railroad recently conducted radio communication tests between a locomotive and the caboose of a goods train on a 1,140-mile round trip between Denver and Salt Lake City, and also between the yard office and a shunting locomotive at Roper, Utah. The apparatus used was of the high-frequency, short-wave, frequency-modulation type, supplied by the General Electric Company.

Each set, combining reception and transmission, is housed in a case about the size of a medium home radio set, and is used in conjunction with whip-like antennæ on the nose of the locomotive and the rear platform of the brake van. To supply the necessary current (a.c. 110V, 60W), lightweight portable generators, driven by gas engines, were mounted on the locomotive and caboose.

The route covered is of interest as the altitudes range between 4,080 ft. at Green River and 9,300 ft. in the 6¼-mile Moffat Tunnel; there are 51 other tunnels, and the location varies between open desert and deep mountain gorges, with numerous curves.

Communication throughout was excellent, save in the Moffat Tunnel, where a feeder aerial or some re-broadcast arrangement may be necessary to ensure efficient reception. The length of train varied from 52 to 70 bogie wagons, with caboose, drawn by a quadruple-unit 5,400-b.h.p. diesel-electric locomotive. Among the uses to which the communication was put was to give the "right-away" from guard to driver after each stop, and to advise the driver that the rear brakeman had returned to the caboose after flagging or closing switches; in this way considerable time was saved, especially at curved locations where the head-end of the train could not be seen from the rear end. The driver was able to advise the guard *en route* that a hot box was developing on one wagon near the locomotive, and the guard advised the driver of sticking brakes at the rear end of the train. An interesting test was that of mounting a receiver in a motor car, which was driven through Denver city streets, and picked up messages from the train when the latter was as much as 53 miles from Denver.

Railway National Safety Contest

Some good records have been made by railways of the United States in the competition for the 1943 awards in the Railroad Employees' National Safety Contest promoted by the National Safety Council. Among the larger class 1 lines, the Pennsylvania-Reading-Seashore Lines (in the 3,000,000-8,000,000 man-hr. group) had no employees killed and only 23 injured for a casualty rate (which includes both killed and injured) of 5·64; this was almost exactly equalled by the 5·63 of the Western Maryland Railway, at the top of the 8,000,000 to 12,000,000 man-hr. group, with one killed and 70 injured during 1943.

A still lower casualty rate was that of the Norfolk & Western Railway, heading the lines with a total of over 50,000,000 man-hr. in the year; the figure in this case was 4·63, and resulted from 8 employees being killed and 257 injured during the year. In the 20,000,000 to 50,000,000 man-hr. group, the Reading Company had the best record, with 3 killed and 334 injured for a casualty rate of 7·11. Among the short lines, the Charleston & Western Carolina Railway achieved distinction by working in the 1,000,000 to 3,000,000 man-hr. group with no greater casualty list than 3 employees injured during the year, and none killed; the casualty rate of this company was as low as 1·36.

Notwithstanding the fact that the year 1943 saw the total man-hr. on American railways rise to 3,690,185,000, compared with 3,322,556,000 in 1942, the number of fatal accidents in 1943 on the lines of the winning railways was less than half that of 1942, and the number of injuries was reduced by over 8 per cent.

SWITZERLAND

Federal Railways Results

The Swiss Federal Railways report a net profit of fr. 80,470,000 for the first five months of this year, against fr. 81,570,000 for the corresponding period of 1943. The decrease is due to a rise in expenses from fr. 114,660,000 in the first five months of 1943 to fr. 126,590,000 in the same period of 1944. The number of passengers carried was 80,940,000, an increase of 7,560,000 over the first five months of the preceding year; goods traffic decreased slightly, from 8,860,000 *tonnes* to 8,240,000 *tonnes* in 1944.

Referring to activities in May, the report states that the Federal Railways conveyed 16,800,000 passengers in that month of 1944, compared with 15,000,000 in May, 1943. Goods traffic increased from 1,740,000 *tonnes* in May, 1943, to 1,840,000 *tonnes* in May, 1944. Revenue from passenger transport in May, 1944, was fr. 19,370,000 (fr. 16,520,000), and from goods traffic, fr. 24,470,000 (fr. 21,680,000). The total revenue for the month in question amounted to fr. 46,000,000 (fr. 38,650,000), and expenses to fr.26,230,000 (fr.24,210,000).

Multiple-Aspect Mechanical Signalling, S.I.R.

The South Indian Railway has obtained very satisfactory results with multiple aspect signalling, both mechanical and electrical, and is extending the use of it

By Major C. A. White, District Signal & Telegraph Engineer, S.I.R., Trichinopoly

IN 1939 the South Indian Railway decided to adopt the double-wire method of working points and signals and to make trials with the multiple-aspect system of semaphore signalling designed by the Signal Engineer of the former Assam-Bengal Railway, Lt.-Colonel E. W. Baker, I.E., for a section of route for which ordinary Indian "B" class signalling was not suitable, as the line runs through dense jungle country and has numerous curves. A good sight of the outer signal—which is an absolute stop signal—is essential, and this could not be obtained under such conditions. (The Assam-Bengal signalling was described in *The Railway Gazette* for August 29, 1941). The S.I.R. selected two sections for the experiment, one on its broad-gauge lines, where the topography was such that "B" class signalling could not easily be used, because of the short sighting of the signals, and the other on its metre-gauge lines, in flat open country. The broad-gauge section was brought into use in October, 1940, and the metre-gauge one in November, 1941.

Signal Aspects

With the exception of those used for the "on," or normal, positions of the distant and stop signals, the signal aspects represent an entire departure from those ordinarily used with manual block working in India and are as follow:—

Fishtail arm (Distant signal)

Horizontal ... Caution. Be prepared to stop at the next signal.
45 deg. ... ... Attention. Pass next signal at restricted speed.
90 deg. ... ... Proceed.

Square end arm (Stop signal)

Horizontal ... Danger. Stop.
45 deg. ... ... Caution. Be prepared to stop at the next signal.
90 deg. ... ... Proceed.

(The arms move in the upper quadrant)

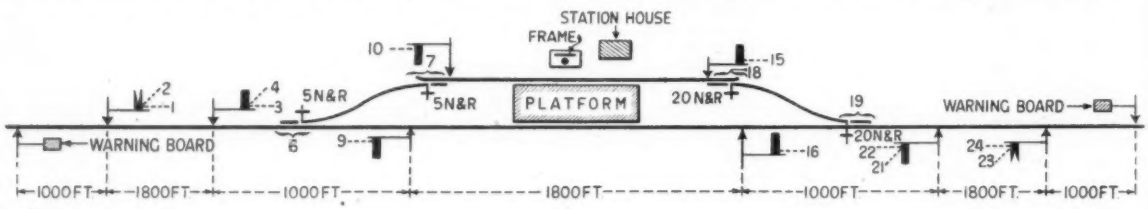
Night indications

Danger, Red; Caution, Single yellow; Attention Double yellow; Proceed, Green.

The attention indication at the distant signal instructs the driver to reduce speed past the next signal to the speed limit prescribed for the turnout. At places where loop or branch lines are not isolated by trap points from the high-speed line, or overlaps provided in lieu thereof, the caution indication at the outer signal, where the train has not been restricted already by the distant, imposes a speed limit of 30 m.p.h. Drivers are warned that they are nearing a distant signal by a board, placed 1,000 ft. in rear and 12 ft. 6 in. high from rail level, measuring 5 ft. x 3 ft. and painted in diagonal black and white stripes.

The accompanying diagram shows a metre-gauge station signalled for unrestricted speed on the straight route. The present speed limit is 45 m.p.h. but the signals are spaced for 50 m.p.h., allowing a margin for future increase. Gradients would necessarily alter the spacing, but the overlaps would normally be adequate. On the broad-gauge section, the same general principles have been followed, but the maximum speed through the station is only 30 m.p.h., as isolation of the loop is not provided. There are no starting signals and the outer cannot show the clear indication, its arm moving from 0 to 45 deg. only. In the latter position it imposes a speed limit of 30 m.p.h. Signal spacing is the same as for the metre-gauge station, but on account of the heavy curves there is a general speed limit of 40 m.p.h. throughout the section. This has necessitated a local rule to the effect that when a train has to be stopped out of course, the distant signal may be pulled off only to give the attention indication (45 deg. aspect) and must never show clear.

This system has some disadvantages, as should a train be stopped at the outer and the signal is then pulled off to show caution, speed must be limited to the most restrictive figure, as the driver, not knowing which route he is to take, must not exceed the speed applying to the most restrictive one. A further disadvantage is that the speed indication of the attention aspect may cause a certain delay when it is combined with 4-aspect automatic block, and it may be advantageous to add route indications, but for ordinary purposes the system has proved adequate. On the other hand, it will be seen how readily signal aspects can be co-ordinated, irrespective of the type of block used and the length of the block sections. Work is already in hand to convert the 3-aspect



LEVER NO.	RELEASES	LOCKS	BACK LOCKS
1	—	—	2 (13 PULL)
2	1	—	4
3	—	—	4 (13 PULL) 16
4	2, 3	9, 10, 15, 21	(13 PULL) OR (13 PUSH)
5	9, 10 (13 PUSH) (13 PULL)	6 (7W 6N)	(7W 6R) 6
6	10 (13 PUSH)	9 (13 PULL)	—
7	(5W 6R)	(5W 6N)	—
8	SPARE SPACE	—	—
9	22	4, 6, 16	5
10	—	4, 15, 21	5, 6
11	SPARE SPACE	—	—
12	" "	—	—
13 PUSH	4, 21	—	5, 6, 19, 20
13 PULL	1, 3, 4, 21, 22, 24	6, 19	5, 20
14	SPARE SPACE	—	—
15	—	4, 10, 21	19, 20
16	3	9, 19, 21	20
17	SPARE SPACE	—	—
18	(20 W 19R)	(20W 19N)	—
19	(13 PUSH) 15	(13 PULL) 16	—
20	(13 PUSH) (13 PULL) 15, 16	(18W 19N) 19	(18W 19R) 19
21	22, 23	4, 10, 15, 16	(13 PULL) OR (13 PUSH)
22	—	—	9 (13 PULL) 21
23	24	—	21
24	—	—	(13 PULL) 23

8, 11, 12, 14, 17, SPARE SPACES
13 PUSH—LOOP KEY
13 PULL—MAIN KEY
5 AND 20 DETECTOR LEVERS

NOTE.—At a broad gauge station there are no starting signals and the loop is not isolated. There is a speed limit of 30 m.p.h. and the outer signals show stop or caution only. When a train is to be stopped out of course the distant signal displays the attention indication (45 degrees aspect)

Multiple-aspect semaphore signalling for unrestricted speed as applied to typical metre-gauge station. South Indian Railway

colour-light signals, working with automatic block on the electrified section; as well as the 2-aspect colour-light signals, working with manual block on the neighbouring steam line. The necessary 4-aspect signals have arrived, but the work is temporarily held up because of shortage of cable.

When this is completed, 46 route miles of line, embracing 79 track miles, will be worked on the new system and will include automatic and manual block, power interlockings with colour-light signals and mechanical interlockings with semaphore signals. Up to December, 1943, there has not been a single case of a driver over-running a stop aspect on these semaphore sections, and, so far as it has been possible to obtain them, figures, combined with those on the straight 3-aspect automatic block in use for the last 12 years show that the chances of this form of accident, where a stop aspect has its own individual previous warning, are reduced in the proportion of 32 to 1. The railway has received a request from the drivers of the broad-gauge running shed concerned for the extension of the system, and it is generally proving very popular with the operating staff. It is the intention of the S.I.R. to extend multiple-aspect signalling as far as possible.

All apparatus is worked by double wire from a central lever frame operated by a pointsman. The signal mechanisms are of the cam type, with overrun for broken wire protection; the point mechanisms are economical, the switches being worked by cam and the locks by rack and pinion. They are provided with broken wire locks.

Detectors are provided on each point and trap. They detect the points both ways and the lock as well, and are operated by separate levers. Both detector and point levers are provided with clutch mechanisms so that if the function fails to respond completely to the lever, the clutch slips and fouls the locking, rendering it impossible to operate any dependent levers. Interlocking between signals and token block instruments is provided by means of key locks on the starting signal levers and stationmaster's control is provided on both signals and points. There have been remarkably few failures at these stations. Such as do occur are caused by careless manipulation of clutch levers or points being thrown out of adjustment by sinkage. Only one case of broken transmission has occurred, due to the split pin being left out of a connecting link-pin.

The sequence of operation is as follows: The pointsman sets up the required route and reverses the detector levers. This releases the relative route key, which the pointsman takes to the stationmaster. The latter inserts the key into an interlocked key box, which releases either the up or the down outer signal key. This signal key, which backlocks the route key, is handed back to the pointsman, with the requisite starting signal key, if the block section ahead is clear, and the pointsman returns to the frame and operates the signals accordingly. By this means a positive route control is established, which cannot be altered in front of an approaching train on account of the time required for the re-exchange of the keys. In the case of despatch of a train which has stopped at the station, no route control is required, the starting signals affording sufficient protection. This system of route control has proved very satisfactory for ordinary crossing stations, but, naturally, at busy stations it would be too cumbersome and other arrangements would have to be made to avoid delay when re-setting routes.

Cost

The cost per station (pre-war figures) on the metre-gauge section is about Rs. 17,000 as opposed to Rs. 26,000 for ordinary "B" class Standard III 2-aspect signalling, and on the broad-gauge it is Rs. 9,500/-, which is about equal to "B" class Standard I. Both types of layouts show a saving on operating staff, as only one pointsman is required to operate all signals and points as opposed to two required for Standard III and at least two —and sometimes three—for Standard I.

Engineering Works on the Bakerloo Line

Renewal of track foundations and modernisation of the permanent way

THE closing of the Bakerloo Line from Piccadilly to Waterloo from August 14 until August 25, recorded in our August 18 issue, was required because of the need to carry out heavy repairs and renewals to permanent way and concrete foundations inside the section of the line which passes under the river; certain structural alterations also were made which could not be dealt with during the few hours available at night. It was therefore necessary to close this section of the underground railway for ten days.

During peak hours 32 six-car trains an hour run on the main section of the Bakerloo Line between Elephant & Castle and Baker Street; 14 of them go to Stanmore. Of the remaining 18, eight run to Harrow and four of these continue to Watford. The other 10 trains turn at Queen's Park. The work, which has now been completed, consisted of removing the permanent way and armour plate on which the track rested, the flame cutting of the plate into two sections approximately 4 ft. by 10 ft. so that it could be handled the more easily, and finally the removal of the old concrete. When this work was completed, fresh concrete was put down on the cast-iron segments and the track relaid with standard cross sleepers of Jarrah wood, standard 95 lb. rails and special section 85 lb. conductor rails.

A minor operation of some interest was the fitting of 1,000 special corbel plates to support the armour plate lining of the tunnel above rail level after the concrete and bottom section of plating have been removed. To do this a section of plating about 18 in. square was cut out by oxy-acetylene at each outer ring joint; when this was done a pair of special corbel plates was secured at this joint by bolts and distance pieces, using the segment bolts as an anchorage. As the pitch of the bolts varied, relative to the lining joint, the two holes in each bracket had to be cut out by oxy-acetylene to ensure a good fit. The armour plate extends for a distance of 540 ft. in the southbound section and 480 ft. in the northbound section.

The work was carried out under the direction of Mr. C. E. Dunton, Permanent Way Engineer (Railways), by 500 men working in three shifts; 60 or 70 of the men were underground railway maintenance personnel. The remainder were gangers and platelayers who normally maintain open sections of the track. Air compressor plant was installed at Charing Cross underground station and the whole of the welding and flame cutting of plates was done by oxy-acetylene; 25 burners were used to cut the armour plates and shape the corbels plates.

Twenty-four dump and material trains a day were fitted in at night or between the ordinary services; both platforms at Charing Cross and Waterloo were used for loading and unloading; scrap materials were sent to Lillie Bridge for disposal.

The Bakerloo Line from Baker Street to Kennington Road (the latter station was renamed Westminster Bridge Road in August, 1906, and Lambeth North in April, 1917), was opened to traffic on March 10, 1906. In 1920 the under river section of this tube between Waterloo and Charing Cross was lined with steel armour plate throughout the circumference of the tube as a precaution against enemy action, and subsequently, in August, 1939, floodgates were introduced at Waterloo and Charing Cross Stations to prevent flooding of the tube in the event of bomb damage.

Although the regular nightly inspection and renewal work on this section has been maintained throughout the war, special treatment on a large scale recently had become necessary as a result of water percolating into the concrete foundations over a period of many years. It became apparent that the concrete was disintegrating and that the track and bottom layer of armour plating was becoming unstable, defects which could not be remedied without major work being undertaken.

One of the major difficulties with which the engineers had to contend was the handling of materials. The track was removed from the Charing Cross end of the tunnels progressively towards Waterloo; this meant that the armour-plate sections, each weighing about 15 cwt. when cut up, had to be loaded on to small trolleys, manhauled by means of a winch on to flat bogie wagons and hauled by battery-driven locomotive to Waterloo, where they were collected and loaded on to three bogie wagons for disposal when the work was completed. The old longitudinal sleepers and bridge rails, conductor rails, were removed in the same manner. The 200 tons of broken concrete and new materials were fed in and out *via* the Charing Cross end. The southern floodgates at Charing Cross were left open and the tube was sealed by the floodgates at the north end of Charing Cross Station and by a temporary diaphragm at the south end of Waterloo Station; ventilation was obtained by a large exhaust fan at Waterloo. In spite of this, the heat and dust made working conditions very arduous, especially for the labour which had to be brought in from outside track maintenance. Arrangements were made to assist the men by providing them with good catering and other amenities.

(*See illustrations on page* 214)

Conversion of the "O4" Class L.N.E.R. 2-8-0 Tender Locomotives

A numerous class of engine has been rebuilt to receive standard boiler and cylinder castings

ONE of the most useful and widespread types of locomotive on the L.N.E.R. is the two-cylinder 2-8-0, class "O4," designed by the late Mr. J. G. Robinson, which achieved fame through being the design selected by the Ministry of Munitions during the war of 1914-18, for service with the Railway Operating Division in France and in other overseas theatres of war. As that war was nearing its end by the time these engines were being produced in quantity, many of them never went abroad, and after various vicissitudes most of them were absorbed by the L.N.E.R. There were, in addition, numbers of similar engines built for the former Great Central Railway; and the L.N.E.R. now possesses a total of over 300 of this type. The design originated as far back as 1911, so it is now thirty-three years old; and in consequence certain features of the initial design can be regarded as suitable for modernisation.

As the principal replacement items during the remaining life of these engines will be the cylinders and boilers, an effort has been made to plan a conversion of the type to take the new standard L.N.E.R. boiler, interchangeable with that of the "B 1" class engine, at the same time fitting the standard cylinder castings and substituting Walschaerts for Stephenson valve gear. As many other minor details as possible have also been made interchangeable with those of class "B 1." No. 6595 is the first engine to be so rebuilt.

Extensive Alterations

Despite the extensive kind of the alterations, the total weight of the engine is practically unchanged. The new boiler is larger than that originally fitted; the internal diameter has been increased from 4 ft. 8 in. to 5 ft. 6 in. and the length of the barrel is reduced from 15 ft. to 13 ft. 11⅞ in.

There is a handsome increase in working pressure—from 180 lb. per sq. in. to 225 lb. per sq. in., at which steam is supplied to cylinders now 20 in. (originally 21 in.) in diameter; the stroke remains 26 in. The tractive effort is raised, in consequence, from 31,326 lb. to 35,518 lb. at 85 per cent. boiler pressure. The grate area is increased from 26·24 to 27·9 sq. ft. The standard Gorton tender is retained.

The external appearance of the engine has been much changed in the process, and it now has all the looks of a Doncaster locomotive. The rebuilding was, of course, fairly extensive, leaving little beside the frames, wheels, and a few other details of the original engines. A high running platform has been provided, eliminating the long box-like splasher which covered three of the four coupled-wheel tops on each side of the old engine.

Comparative Details

Comparative dimensions of the locomotive are appended :—

	Before rebuilding	After rebuilding
Cylinders, dia.	21 in.	20 in.
,, stroke	26 in.	26 in.
Valve gear	Stephenson	Walschaerts
Evaporative heating surface—		
Tubes	1,349 sq. ft.	1,508 sq. ft.
Firebox	154 sq. ft.	168 sq. ft.
Total	1,503 sq. ft.	1,676 sq. ft.
Superheating surface ...	242 sq. ft.	344 sq. ft.
Combined total ...	1,745 sq. ft.	2,020 sq. ft.
Grate area	26·24 sq. ft.	27·9 sq. ft.
Boiler pressure per sq. in.	180 lb.	225 lb.
Boiler barrel, dia. ...	4 ft. 8 in.	5 ft. 6 in.
,, ,, length between tubeplates	15 ft. 0 in.	13 ft. 11⅞ in.
Tractive effort at 85 per cent. boiler pressure ...	31,326 lb.	35,518 lb.
Adhesive factor	4·70	4·15
Weight of engine in working order	73 tons 4 cwt.	73 tons 6 cwt.

New "Renfe" Locomotive Numbering System

A standard 7-figure system of numbering has been applied to the engines of the Spanish National Lines

On the forming of the unified Spanish railway system it became necessary to devise a method of numbering the locomotives which could be readily applied to the entire stock, totalling 3,099 on March 1, 1943. At the outset, there were many repetitions of the one number; there were, for example, 10 engines bearing the number 3. Some of the former separate lines already had systems under which specified blocks of numbers were allocated to particular classes of engine, but on others mere serial numbering was all that obtained. The practice of awarding premiums to drivers for saving coal and other materials made it especially desirable to get rid of all duplicate numbers and have one system enabling any engine to be identified. There are 234 classes of engine in service at present, and the allocation of blocks of numbers to each was thought impracticable.

After some discussion, it was decided to adopt a 7-figure system of numbering arranged as follows :—

Locomotives with Tender

1st digit indicates number of leading axles.
2nd digit indicates number of driving axles.
3rd digit indicates number of trailing axles.
4th digit indicates number of cylinders.
5th, 6th, and 7th digits form the actual number of the engine within its own class.

Tank Locomotives

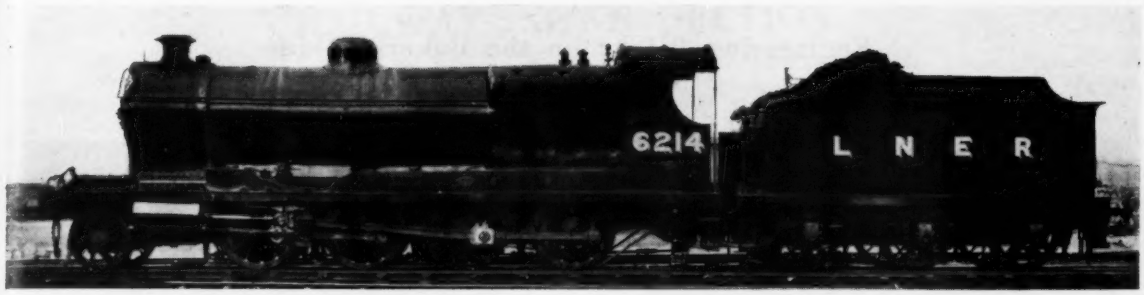
The same arrangement is followed, except that the 4th digit is invariably zero, indicating a tank engine at a glance; the fifth gives the number of cylinders, and the two last form the actual number of the engine within its own class.

For example, the 4-cylinder Pacific-type engines of the former Norte system bear numbers beginning 2314001 to 2314006. They would be spoken of in practice as "231 class, numbers 4001 to 4006"; the digit 4 indicates, as explained, the number of cylinders. The Norte 4-cylinder "Mountain" class are numbered 2414001 to 2414066, on like principles. The 4-cylinder "Confederation" class tanks, also originally Norte property, are numbered 2420401 to 2420406; the fourth digit, 0, indicates that a tank locomotive is meant. Similarly, the old Western 2-cylinder tanks, of the same wheel arrangement, bear numbers 2420201 to 2420208. Finally, the new "Sante Fe" class engines, recently acquired, hitherto numbered 5001 to 5020, receive in the new system numbers 1513101 to 1513120.

Fears that this 7-digit arrangement would prove awkward when telephoning, compared with the 5-figure numbers, have not been realised. The first three digits can be conveniently separated and followed by the word "class" or "series," for greater clearness. In other countries, numbering systems are in use in which, by the addition of letters and index figures, various characteristics of an engine, such as superheated or saturated steam, simple or compound, etc., can be indicated, but it was not thought advisable to do this. It is considered in Spain that all ordinary service requirements can be met by the method outlined.

Electric locomotives are numbered within the second thousand of ordinary serial numbers, and various hundreds are allocated to the different horse-powers, from the higher to the lower. Numbers up to 1999 are reserved to the locomotives of the Ripoll-Puigcerdâ line—this was State before—which retain their old ones. Electric motor coaches are numbered from 101, and are classified by rising horse-powers and types under distinct hundreds. Other types—diesel, etc., of railcar or motor coach—are numbered from 9001 onwards, in hundreds, also by rising horse-power classes. A few small electric shunting locomotives, or tractors, as they are termed, as well as some electric motor coaches, of the Bilbao-Portugalete line, are retaining their old numbers at present; oil and diesel shunting engines are being numbered from 10001 onwards. It is understood that the new arrangements have met with general approval.

LOUDSPEAKERS FOR BREAKDOWN TRAINS.—The Philadelphia & Reading Railroad, as recorded by our American contemporary, the *Railway Age*, has introduced certain additions to the equipment of breakdown trains which have proved to be of value at the scenes of derailments, and are expected to be equally useful if the breakdown trains are called on to help in connection with floods, fires or other emergencies. The most interesting of these new items is the loudspeaker mounted on the jib of the breakdown crane and connected to a voice-amplifying system. The foreman is provided with a hand microphone, which is attached to a long trailing flexible cable so as to permit of free movement about the scene of operations. Thus the foreman can view operations from the best point while maintaining communication with the crane operator. The latter also can use the loudspeaker, by means of a microphone which is mounted in the crane cab. With this equipment all workers hear orders and conversations over the loudspeaker and thereby are kept informed of the progress of operations, and can be warned of sudden danger. The work of clearing the tracks can be co-ordinated under the control of one man, and the confusion which sometimes arose in the past in giving orders can be avoided.



L.N.E.R. "04" type 2-8-0 locomotive before conversion

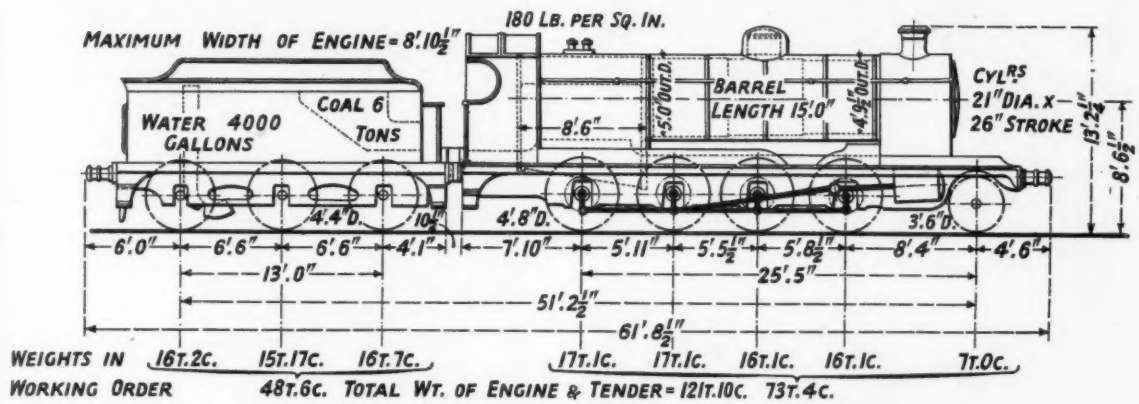
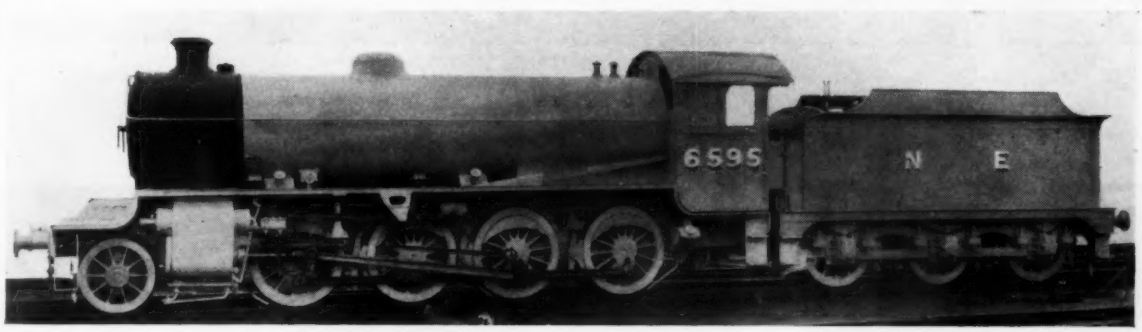

MAXIMUM WIDTH OF ENGINE = 8'.10½"
180 LB. PER SQ. IN.
WATER 4000 GALLONS
COAL 6 TONS
BARREL LENGTH 15'.0"
CYLRS 21" DIA. X 26" STROKE
WEIGHTS IN WORKING ORDER
16T.2C. 15T.17C. 16T.7C. 17T.1C. 17T.1C. 16T.1C. 16T.1C. 7T.0C.
48T.6C. TOTAL WT. OF ENGINE & TENDER = 121T.10C. 73T.4C.

Diagram showing principal dimensions and weights of the locomotive before conversion



L.N.E.R. "04" type 2-8-0 locomotive converted and reclassified "01"

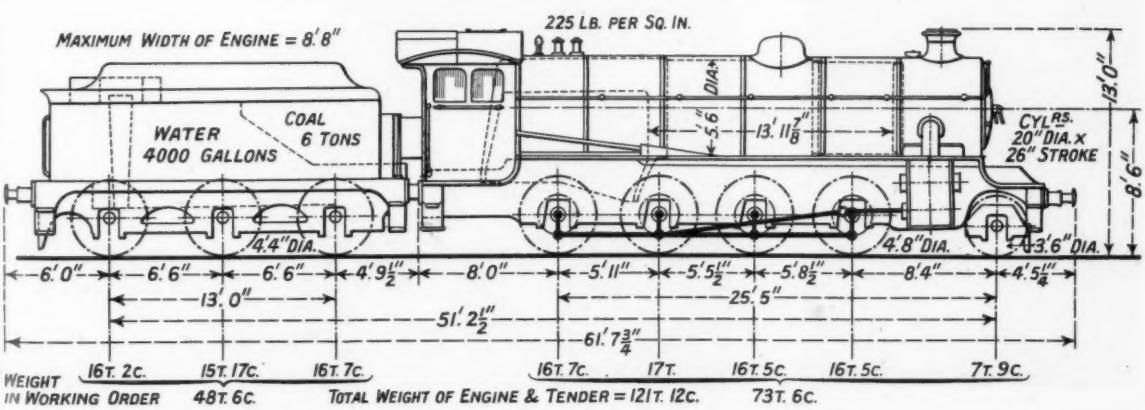
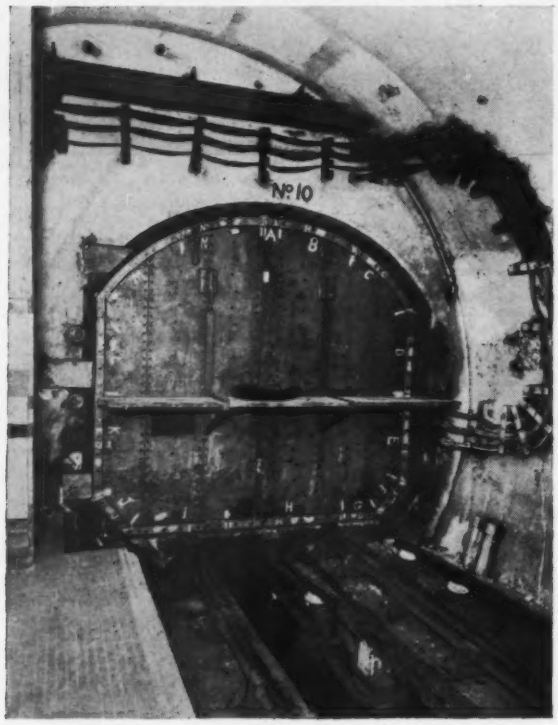

MAXIMUM WIDTH OF ENGINE = 8'.8"
225 LB. PER SQ. IN.
WATER 4000 GALLONS
COAL 6 TONS
CYLRS. 20" DIA. X 26" STROKE
WEIGHT IN WORKING ORDER
16T. 2C. 15T. 17C. 16T. 7C. 16T. 7C. 17T. 16T. 5C. 16T. 5C. 7T. 9C.
48T. 6C. TOTAL WEIGHT OF ENGINE & TENDER = 121T. 12C. 73T. 6C.

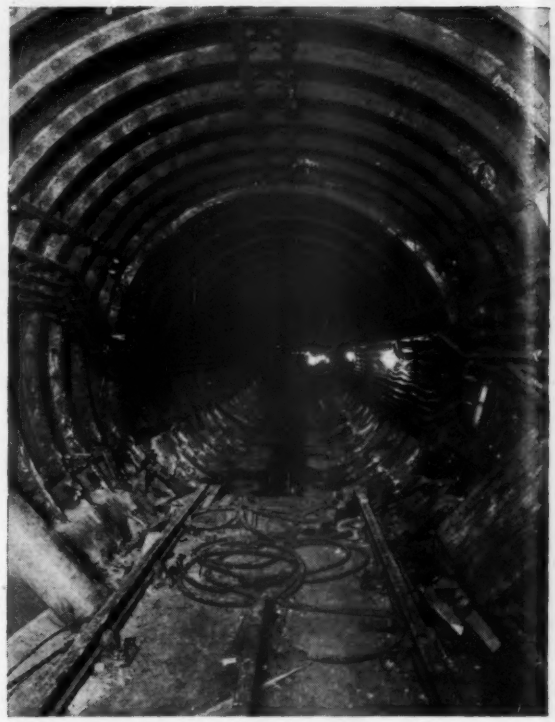
Diagram showing principal dimensions and weights of the locomotive after conversion
(See article on opposite page)

Engineering Works on the Bakerloo Line

(*See article on page* 211)



Watertight diaphragm across tunnel, south end of Waterloo Station



General view of section of tunnel after removal of lower armour plate

Fitting a corbel plate to support arch plates

Mr. C. E. Dunton, Permanent Way Engineer (Railways), L.P.T.B., (right) watching the cutting of armour plate to take corbel plates

RAILWAY NEWS SECTION

PERSONAL

Mr. H. L. Saunders has been appointed Comptroller-General of Patents, Designs & Trade Marks, in succession to Sir Frank Lindley, who retired on August 31.

Mr. F. A. Pouliot, Superintendent, Laurentian Division, Canadian Pacific Railway, has been appointed General Manager of the Quebec Central Railway, in succession to Mr. G. D. Wadsworth, who has retired.

Mr. Albert A. Gardiner, Assistant General Passenger Traffic Manager, Canadian National Railways, has been appointed General Passenger Traffic Manager, in succession to Mr. C. W. Johnston, who has retired.

The late Lt.-Colonel Clive Mansfield Turner, who was General Traffic Manager, Associated British & Irish Railways Incorporated, New York, left £3,325.

Mr. S. P. Havenga has been appointed a member of the South African Railways Service Commission from July 11, 1944, until March 25, 1948, in place of Mr. C. G. C. Rocher, who has retired. Mr. Havenga recently was appointed Superintendent (Operating), Cape Town, South African Railways & Harbours.

Mr. Revelle W. Brown, President of the Lehigh Valley Railroad, has been appointed President of the Reading Company, U.S.A., in succession to Mr. Edward W. Scheer, who has retired. Mr. Felix R. Gerard, Vice-President in charge of Operation & Maintenance, Lehigh Valley Railroad, has succeeded Mr. Brown as President.

Mr. Robert Marshall, who recently retired from the position of District Goods & Passenger Manager, Ayr, L.M.S.R., has been appointed General Secretary of the St. Andrew's Ambulance Association.

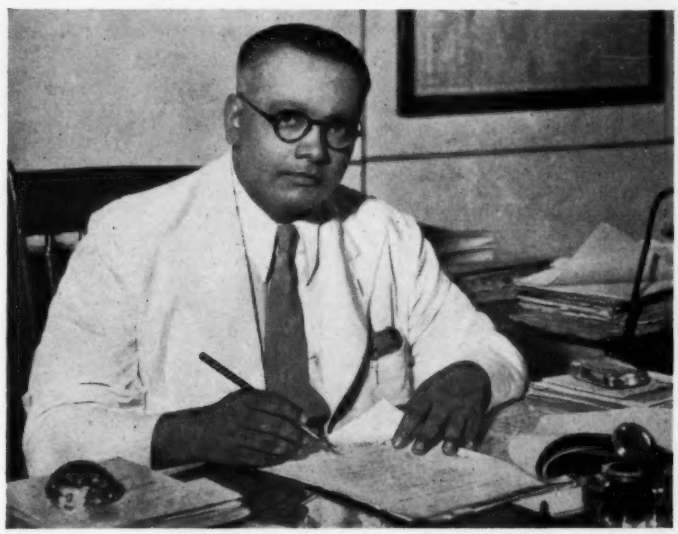
The late Mr. Robert Armitage, who was Chairman of Brown Bayley's Steel Works Limited and of the Farnley Iron Co. Ltd., and a Director of the Wagon Finance Corporation Limited and Stainless & Rustless Steel Co. Ltd., left £35,118.

The L.N.E.R. announces that Mr. E. S. Hobbs has been appointed Goods Agent, Harrow-on-the-Hill, Metropolitan & Great Central Joint. In February, 1943, Mr. Hobbs became the Resident Instructor at the L.N.E.R. Staff Training School at Watton House, Hertfordshire, and in May, 1944, was transferred to a similar position at Harrogate, which he now vacates.

It is announced also that Mr. J. G. Handley, Assistant Stationmaster, Liverpool Street, has been appointed Acting Stationmaster, Bridlington.

To restore the balance of goods-wagon interchange between U.S.A. and Mexican railways, Señor R. M. Campos, Assistant Freight Traffic Manager, National Railways of Mexico, has been delegated as the Washington representative of the railways of his country. He will co-operate with the Association of American Railroads in setting up machinery to handle the issue of permits to cover consignments from the U.S.A. to Mexico, so as to maintain a flow of traffic which will meet the economic needs of Mexico and yet keep a minimum number of U.S.A.-owned wagons in that country.

Rai Bahadur Nibaran Chandra Ghosh, O.B.E., M.Inst.T., Chief Operating Superintendent, East Indian Railway, who, as recorded in our May 19 issue, has been appointed General Manager, joined the E.I.R. from Calcutta University, where he had been studying for the M.A. degree in Economics, with Railway Transport as a subject. He was appointed Probationary Assistant Traffic Superintendent after passing a competitive examination in 1913, and was confirmed as Assistant Traffic Superintendent in 1916. During the war of 1914-18, he worked in charge of coal allotment. He proceeded to England on leave in 1922, and studied English railway working (as a pupil with the L.N.W.R.). Rai Bahadur Ghosh returned to India, and in 1924 was promoted as District Officer at Dhanbad; he was confirmed in that appointment in 1925. He was in charge of arrangements at the Kumbh Mela in 1927, when he was Superintendent, Transportation, at Moradabad. From 1930 to 1934, he was Superintendent, Transportation, at Howrah, and during that time ran a record stone traffic for the protection of Hardinge Bridge. In the latter year Rai Bahadur Ghosh was selected as Divisional Superintendent; he was the first Indian divisional superintendent and was the youngest officer to hold that rank at that time on any railway in India. In 1938 he organised traffic serving the Kumbh Mela at Hardwar, when a record pilgrim traffic was moved. When war broke out in 1939, he was Divisional Superintendent at Howrah. Subsequently he was appointed by the Railway Board as Transport Advisory Officer, Railway Board, in connection with coal traffic. The efforts of the new office resulted in a marked increase in coal loading in 1940, a fact which received comment in the budget speech for 1940-41 of the Member in charge of Railways. In December, 1940, Rai Bahadur Ghosh became Chief Operating Superintendent, E.I.R., and provided a movement of record traffic in 1941. In April, 1944, he was appointed General Manager, in which capacity he succeeded Sir Robert Marriott, who became Director-General of Railways, Calcutta Area, at that time.



Rai Bahadur N. C. Ghosh

Appointed General Manager, East Indian Railway

Mr. William White, F.C.I.S., Secretary & Commercial Manager of London Coastal Coaches Limited, has been appointed General Manager of the company in succession to the late Mr. L. M. Turnham. Mr. White is also Secretary of the Samuelson New Transport Co. Ltd.

Sir James Lithgow has resigned from the board of Richard Thomas & Co. Ltd. Mr. Leslie John Davies, General Manager of the company's Ebbw Vale Works, has been appointed a Director. Sir James Lithgow is President of the recently-formed British Iron & Steel Research Association, and is Chairman of William Beardmore & Co. Ltd.

Mr. W. T. Raby has been appointed Assistant Divisional Superintendent in the Department of the Operating Manager (Trams & Trolleybuses), London Passenger Transport Board, in place of Mr. H. Oliver, who has retired.

Mr. N. E. Spencer, former Accountant, Canadian Pacific Railway (France), who was seconded to the Ministry of Supply as Area Transport Officer (North West), and who resigned to join the Navy, has been appointed Assistant to Royal Naval Transport Officer, Plymouth, with the rank of Sub-Lieutenant, R.N.V.R.

Mr. G. Holdorf, A.M.I.Mech.E., A.F.R.Ae.S., has been appointed Chief Engineer, and Mr. Frederick H. Rayer, Chief Designer, of Brush Coachwork Limited. After serving with Vickers-Armstrongs Limited, Mr. Holdorf joined Birmid Industries Limited. His services were lent for two years to the Ministry of Aircraft Production, but in 1942 he was recalled to Birmetals Limited. He has lately acted also in a consultative capacity with Metropolitan-Cammell-Weymann Motor Bodies Limited and

Birmingham & Midland Motor Omnibus Co. Ltd. Mr. Rayer has served with the Great Western Railway, Metropolitan Carriage, Wagon & Finance Co. Ltd., Leeds Forge Co. Ltd., and Metropolitan-Cammell Carriage & Wagon Co. Ltd., with which latterly he held the position of Bus Engineer.

Sir Lakshmipati Misra, Member, Engineering, Railway Board, Government of India, who received the honour of knighthood in the King's Birthday Honours List this year, and on whom, as recorded in our August 18 issue, the Viceroy of India recently conferred that honour, joined the Indian State Railways service in October, 1911. He was appointed an Executive Engineer in 1918. In 1924 his services were lent to the Foreign & Political Department, and he was posted as Deputy-Manager & Engineer-in-Chief of the Baroda State Railways. During that deputation he built the Baroda State's harbour at Okha, Kathiawar. At the end of his deputation in 1927 he proceeded to Europe to study the divisional organisation and general administration on English and Continental railways. He returned to India, to the East Indian Railway, in 1928; and in 1929 he was on special duty with the Railway Board in connection with the implementing of the Washington and Geneva Conventions on that railway. In November, 1930, he was transferred to the North Western Railway as Controller of Stores; but shortly afterwards he was placed on special duty again, to investigate the question of possible economies in the Engineering Department of the East Indian Railway. In 1932 he was appointed Deputy-Agent of the last-named railway, and, after holding that post for three years, he became Divisional Superintendent, Howrah Division. Among important measures introduced by him during his tenure of the latter position were the provision of 30-sec. halts on suburban train services, and the reservation of seats for third class passengers, which was commended in the report of the Wedgwood Committee. In July, 1938, his services were requisitioned by the Home Department of the Government of India as a Member of the Federal Public Service Commission. Sir Lakshmipati Misra was the President of the committee appointed by the Railway Board to inquire into the grievances of the crew (ticket-checking) staff of the East Indian Railway and of the staff of the combined press of the East Indian and Eastern Bengal Railways. On return from duty on the Federal Public Service Commission he was appointed to officiate as General Manager of the Eastern Bengal Railway, and subsequently he was confirmed in that post. After the Assam-Bengal Railway had been acquired by the State and combined with the Eastern Bengal Railway to form the system now designated the Bengal & Assam Railway, he became General Manager of the last-named. During his tenure of that office, the B.A.R. had to deal with the amalgamation of the Assam-Bengal, Bengal Dooars and Jorhat Provincial Railways; the operation of the Dibru Sadiya Railway; heavy refugee traffic from Burma; the local exodus from threatened areas on the railway; sabotage activities; floods; heavy military traffic; and the supply of foodstuffs to railway employees. He also worked as Commissioner for the Port of Calcutta for four years from September, 1939, to September, 1943. He was appointed Member, Engineering, Railway Board, in November, 1943, and has been entrusted with the post-war reconstruction planning in addition to his own duties. Sir Lakshmipati Misra has taken an active interest in the Institution of Engineers (India), of which he was elected President for 1943. He has been associated with a number of war activities on the B.A.R. and in the Calcutta area; and he was mentioned in dispatches for gallant and distinguished service during operations in Burma and on the North-East Frontier, June, 1942, to May, 1943.

Sir Lakshmipati Misra

Engineering Member, Railway Board, Government of India, who has received the honour of knighthood

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Mr. E. G. Taylor, formerly General Sales Manager, who has had over twenty years' service with Tecalemit Limited, has been appointed Sales Director, and Mr. C. S. LeClair, M.I.Mech.E., who has been with the company for nearly ten years in the capacity of Chief Engineer, has been appointed Technical Director.

Mr. E. Desbrey, Chief Messenger, General Manager's Office, G.W.R., Paddington, retired on August 26, after 51 years and 7 months service in that office.

The late Alderman J. H. Lloyd, who was a member of the London committee of Stewarts and Lloyds of South Africa Limited, and formerly a Director of Stewarts and Lloyds Limited, left £330,456.

Mr. J. D. Beddows, B.Sc., has been appointed Metallurgist & Technical Assistant to Dr. E. G. West, of the Wrought Light Alloys Development Association. The appointment has been made necessary by the increasing work of the Association.

Dr. Edwin Gregory, M.Sc., M.I.E.I., F.R.I.C., has been appointed Chief Metallurgist of Edgar Allen & Co. Ltd., in succession to the late Mr. S. J. Hewitt. Dr. Gregory had been Chief Metallurgist to the Park Gate Iron & Steel Co. Ltd. before being appointed in 1943 Assistant Director in charge of the Metallic Materials Section, Aeronautical Inspection Directorate, Ministry of Aircraft Production.

Mr. S. P. Jones has retired from the post of Signal & Telegraph Engineer, Victorian Government Railways, and is now engaged in bringing up to date estimates of cost in connection with the conversion of the Victorian Railways system to standard gauge. (See editorial note in our last week's issue).

Mr. Jones has been succeeded by Mr. W. Forrest, his assistant in the Signal & Telegraph Division for the past 22 years. Mr. Forrest, who is a native of Beechworth, joined the Department as an apprentice in the Telegraph Branch in 1905, after matriculating. When the Telegraph and Signal Sections were later amalgamated, Mr. Forrest became a fitter and subsequently a draughtsman in the Signal & Telegraph Branch. He enlisted for service in the First World War, and left Australia with the Signal Engineers in 1915. He subsequently gained a commission, and served in both Egypt and France. After the war he spent nine months with various British railway companies investigating signal engineering practice. On returning to Australia, he resumed his work as draughtsman, and, after passing through the various sections of the branch and gaining wide experience in its mechanical and electrical activities, he was appointed Construction Engineer. Later he became Maintenance Engineer, which position he held until his appointment as Assistant Signal & Telegraph Engineer. He is a Member of the Institution of Signal Engineers, and an Associate Member of the Institution of Engineers, Australia.

The successor to Mr. Forrest as Assistant Signal & Telegraph Engineer is Mr. C. B. Young, who began his railway career in 1907 as an apprentice fitter and turner in the old Signals Shops at Newport, Victorian Government Railways. Six years later he was appointed Electrical Fitter-in-Charge at Seymour. Subsequently Mr. Young went to Head Office as a draughtsman, and later assisted Mr. G. H. Wion in the installation of power-operated signal equipment in the metropolitan area of Melbourne, including the first metropolitan power interlocking signal apparatus in the South Yarra signal box. After spending a period checking all circuit work for power signalling, he became Power Signal Construction Engineer. Mr. Young has been a member of the Level Crossing Committee since 1932.

TRANSPORT SERVICES AND THE WAR—257

Shelters from Midlands

Nearly 26,000 Anderson and Morrison shelters have been brought by the L.M.S.R. from the Midlands to the London area since the flying-bomb attack on Southern England began.

Flying Bomb Attacks

It was officially stated on August 24 that approximately 7,250 flying bombs had been launched on this country since the attack began in the middle of June. The total to the end of July was some 5,250, and about 2,000 were dispatched during the first three weeks of August.

Free C.D. Holiday Travel

Free railway travel holiday vouchers to places not more than 150 miles from their stations are to be granted to whole-time members of the Civil Defence Services, including the N.F.S. and Fire Guard officials, serving in the parts of Southern England affected by the flying bomb attacks. If any have arranged to go further, they will be granted a voucher on payment of the excess fare above the first 150 miles of their journey.

Coastal Access Ban Lifted

On August 25 the War Office announced the lifting from that date of the ban on entry to the Protected Areas in England extending from the Wash to Lymington (Hampshire), including the Isle of Wight. The removal of the ban on these areas does not mean that, in the view of the military authorities, there is any less danger than heretofore from enemy missiles. These areas will remain Regulated Areas, and the military authorities may still retain, or impose, local restrictions on access to highways and other places. The by-laws made by the Secretary of State for War on March 31 remain in force. Identity cards must always be carried in public places, and telescopes and binoculars must not be used anywhere in these areas.

From midnight on August 25-26 the Regional Commissioner for South Eastern England lifted the curfew imposed under the Defence Regulations including the ban on vehicles and public places.

Servicemen's Night Buses at Liverpool

A transport service from Lime Street Station, Liverpool, for Service personnel who arrive after the last tram has gone, is now provided from midnight until 4 a.m. by two mineral water delivery vans converted into buses at Liverpool Corporation tram depot in Edge Lane. Each bus holds ten inside and one beside the driver. The service is operated jointly by Army Welfare authorities and Liverpool Corporation Passenger Transport Department, and the drivers are Corporation Transport employees who volunteer for the service and work it on a rota. The buses travel along recognised bus routes, arranged and varied from night to night according to the localities the Service personnel wish to reach. Broadly, one bus is used for the northern area and one for the southern area of the city.

The charge is 6d. a head anywhere, and tickets are obtained from the Services Information Bureau at Lime Street Station. No one is allowed on the bus without a ticket, and no civilians are carried. The estimated cost of the service is £300 per annum, which is not expected to be covered by the fare. On August 17, the night the facility was introduced, nearly 100 Service men and women were carried, and it is stated that this was the first occasion since the outbreak of war that no Serviceman was stranded in the City.

German Air Lines

The air services operated by the Deutsche Lufthansa between Germany and Hungary, as well as between Germany and south-eastern Europe *via* Hungary, were discontinued when the German Forces occupied Hungary. They were resumed on May 2. The Berlin-Lisbon service was suspended on August 22.

Through Fares and Rates in Jugoslavia

Through railway fares, and luggage and express goods rates, between Croatia and Slovakia were introduced on August 1. In addition, the Croatian State Railways have through tariffs with Albania, Bohemia-Moravia, Bulgaria, France, Greece, Germany, Hungary, Roumania, Serbia, Turkey, and Switzerland.

Another German Travel Ban

All travel arrangements for German parents intending to visit their evacuated children have been cancelled as part of the total mobilisation measures now under way, and because of priority demands on the German railways, according to a German radio announcement of August 14. The ban was said to cover the whole of August; it was added that any subsequent relaxation would be notified in the German press.

Train Service Reductions in New South Wales

Because of scarcity of coal, drastic reductions in New South Wales passenger and goods train services were announced on August 20. The goods train cuts, which became effective immediately, include up to a 50 per cent. reduction in wagons for iron ore, timber, wood, steel, and cement. The passenger train cuts came into force on Saturday, August 26. Sleeping cars on interstate trains are withdrawn, and the Sydney-Brisbane and Sydney-Melbourne expresses are reduced to one a day. There are fewer interstate mail trains, and many Sunday tourist train runs have been withdrawn. Further cuts are envisaged.

Free Life Travel for V.Cs.

It is understood that the Prime Ministers of the various Australian States will probably agree to a proposal to issue free season tickets for life, available on all Australian trains and trams owned by the Governments or local authorities, to the 60 Australian holders of the Victoria Cross.

New Railway in Northern China

A new railway, branching off at Hanant (Southern Hopeh province) from the Peking-Hankow main line and ending at Naca Auan (Northern Honan province), called the Tzushan Railway, was opened to traffic on April 21 last. It is stated that the line, which cost 18 million Yen to build, was completed in four months.

Northern China Railway Fare Increased

As a result of the continued fall in the value of the currency in Northern China, railway fares and goods rates in that Japanese-controlled country were increased from the beginning of April. Travel restrictions were introduced at the same time, to facilitate increased goods traffic.

Road Transport in Free China

Particulars recently published by the Ministry of Transport of Free China showed that between 1937 and 1944 the road system of Free China was increased by some 6,060 miles. The total lengths completed in individual years are as follow:—

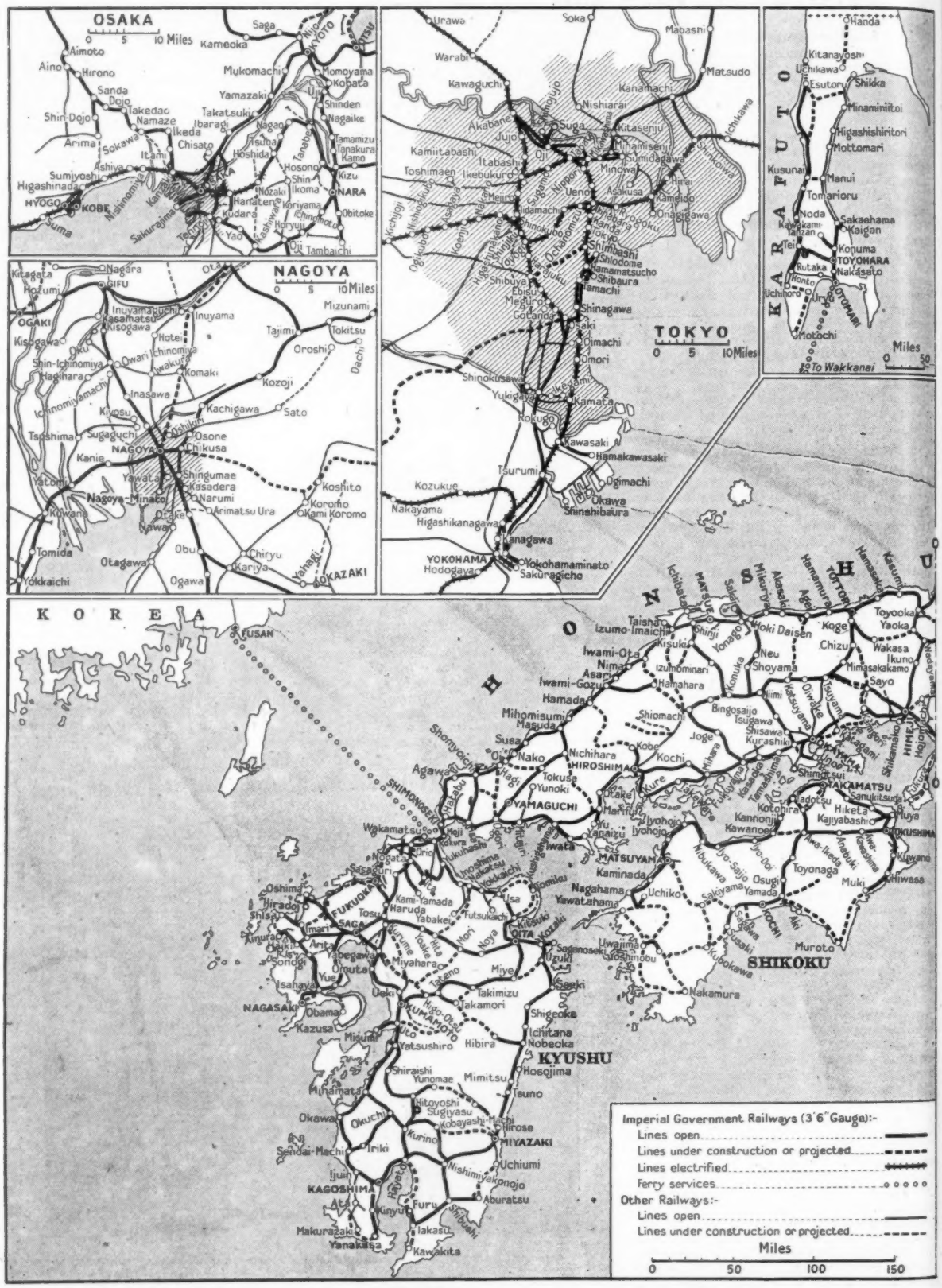
1937	...	...	...	981 miles
1938	...	...	...	600 ,,
1939	...	...	...	1,571 ,,
1940	...	...	...	578 ,,
1941	...	...	...	1,615 ,,
1942	...	...	...	360 ,,
1943	...	...	...	355 ,,

The total length of the road system of Free China amounted to about 31,000 miles at the beginning of 1944, according to a statement made at the opening ceremony of a road construction exhibition at Chungking. Road building has been retarded by the loss of the Burma Road, over which

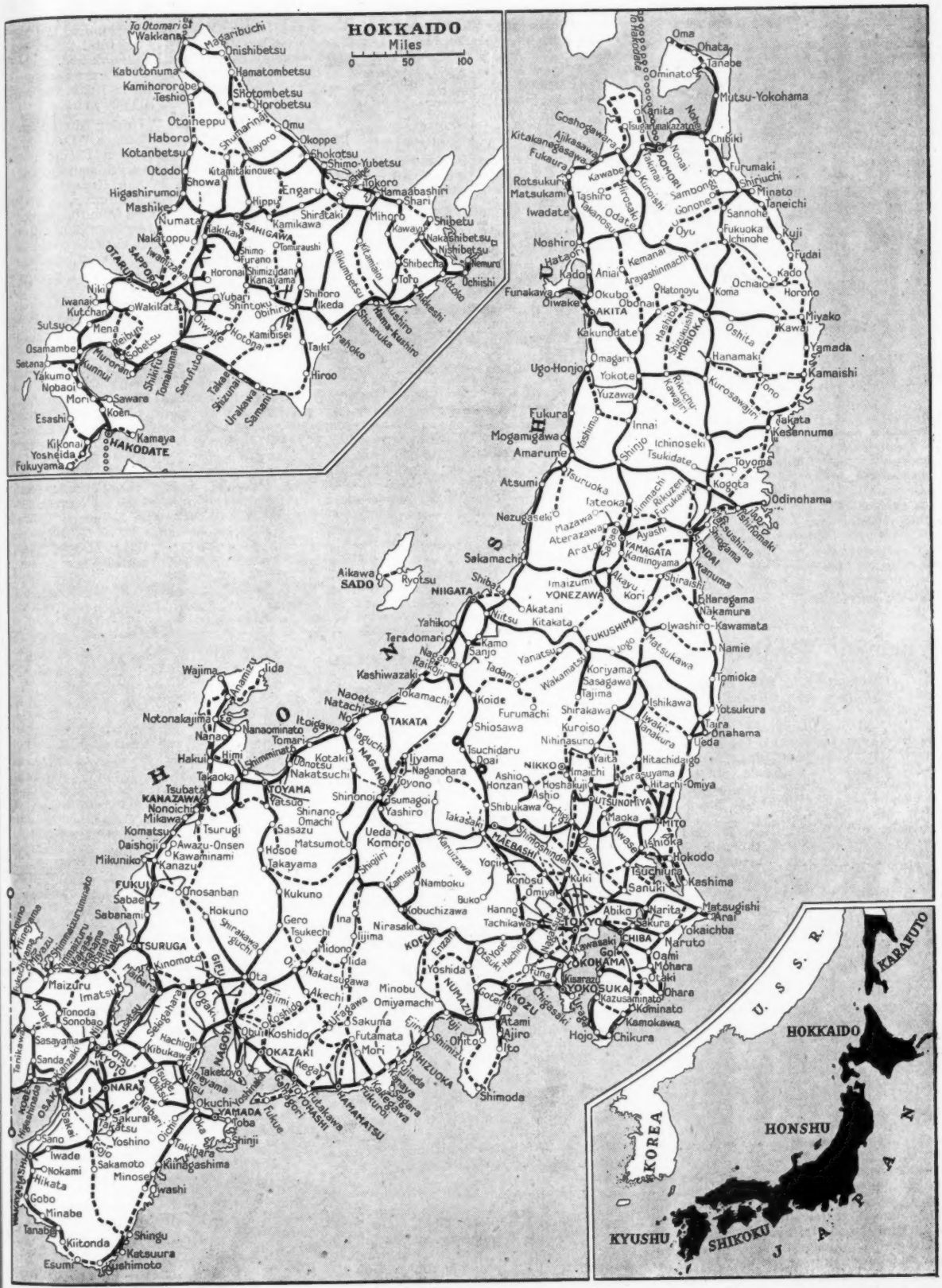
(*Continued on page* 220)

Restored Civilian Rail Transport in France

Passenger train for Allied soldiers and French civilians leaving Cherbourg on the regular service to Carentan, which was restored on August 4 (as we recorded last week). It is operated under the direction of a U.S.A. Army Railroad Battalion. The first Bayeux-Caen passenger train since "D" Day was run on August 21



The railways of the principal islands of Japan



For editorial article on the railways of Japan, see page 205

Transport Services and the War

(*Continued from page* 217)

most of the equipment and machinery was imported. The Chungking Government is said to have controlled some 1,300 motor lorries at the end of 1943, but it is believed that the effective number has since decreased because of the lack of spare parts. From a survey concerning the state of repair of motor lorries in an un-named district near Chungking, it would appear that about a quarter of the total was out of commission, and the balance needed urgent repairs. The special works for the production of spare parts, which the Ministry of Transport set up some four years ago, is said to be unable at present to cope with the increasing demand. Imports of spare parts by air, from the U.S.A., ease the position to a limited extent only.

The Berne-Lötschberg-Simplon Railway

Traffic results for 1943 of the Berne-Lötschberg-Simplon Railway were affected adversely by the suspension of goods traffic between Switzerland and Italy after the capitulation of Italy, when the ports of Genoa and Savona (through which passed a very substantial part of Swiss exports and imports) ceased to be available. Since September 3, 1943, the Lötschberg line has been cut out entirely from the Swiss overseas traffic. Transit traffic between Germany and Italy was resumed about the end of October, 1943, after an interruption of approximately two months, but its volume has been well below normal. Home traffic over the Lötschberg route increased substantially as a result of the further curtailment of road services. Goods transport, which is always the most important feature of the Lötschberg traffic, has fluctuated as follows :—

1938	...	...	1,595,000 metric tons
1939	...	...	2,011,000 " "
1940	...	...	3,259,000 " "
1941	...	...	4,289,000 " "
1942	...	...	4,248,000 " "
1943	...	...	3,494,000 " "

Passenger traffic increased, 4,880,000 passengers having been carried in 1943, against 4,300,000 in the preceding year. Regular passenger services through the Simplon Tunnel have been discontinued since September 3, 1943, but domestic traffic soared considerably.

The excellent working receipts of the 1939-1943 period were due, in the main, to Axis transit traffic. The company's report emphasises that, when the Axis traffic over the Lötschberg route disappears, the position of the company will be the same as in 1914-1918, and the working expenditure will exceed the working receipts substantially.

The American Manpower Shortage

In the first three months of 1944, shortage of train crews delayed for 2 hr. or more on their journeys upwards of 2,800 trains on the larger Class I railway systems of the United States. During the same period, there were more than 6,000 cases in which shunting locomotives were unable to work their full number of daily shifts because of manpower shortage. The result was a slower movement of traffic and reduced use of rolling stock. The spring of 1944 found the railways in good operating condition, with 885 new locomotives and 32,800 new bogie wagons introduced during the previous twelve months. Notwithstanding the fact that by March, 1944, the total number of employees on Class I railways had reached 1,399,848 (an increase of 5·6 per cent. over the corresponding figure in 1943), the railways needed at least 100,000 more.

The " Daylight " Under Shell Fire

On May 12, as the famous " Daylight " streamliner of the Southern Pacific Railroad, U.S.A., was on its northbound journey from Los Angeles to San Francisco, and was passing Tangair, California, a shell, believed to have been fired from the gunnery range at Camp Cooke, exploded 20 ft. from the train. From the fact that the explosion was on the off side of the train, it is assumed that the projectile must have passed over the train, which then received the blast in a backwards direction. Some 33 holes were cut in the side of the kitchen and dining cars, and two negresses employed as dishwashers were injured.

Mexican Railway Traffics

The movement of south-bound loaded wagons through Laredo, Mexico, during March was unusually heavy, showing an increase of 121 per cent. over that for March, 1943. Wagons moving north were also greater in number, but nearly 300 below the figure of February, 1944. The following are the complete figures for February and March, 1944, with those for the corresponding months of 1943 in parentheses : February, 1944, southbound 1,319 (1,277), and northbound 1,913 (1,742) ; March, 1944, southbound 2,620 (1,182), and northbound 1,639 (1,564). Figures for January and February of the present year were included in our issue of August 18 (page 169).

Systematic Wartime Use of Recovered Bridge Material

Since 1926, the Erie Railroad has maintained at Port Jervis, New York State, a bridge shop equipped to fabricate bridgework for use on all parts of the systems. In that year permanent accommodation replaced the initial equipment, which was housed in bogie box wagons. In 1928 an extensive bridge strengthening programme, over the Erie main line from Jersey City to Marion, Ohio, justified a considerable extension of the plant and its facilities. Since the war broke out, the value of the plant has increased still further, as it has made possible the reconditioning on a considerable scale of bridges from abandoned lines or the use of recovered steel for a variety of purposes.

From the webs of plate-girder bridges, for example, it is possible to cut gusset-plates, floor-plates, patch-plates for webs weakened by corrosion, shim plates for bridge bearings, and so on. Parts of angles from lateral bracing that have not been punched are put to a variety of uses. Little re-usable material is found in second-hand truss bridges, but sections cut from floor-beams can be put to the same uses as those from web-plates, and tension-rods can be worked into anchor-bolts, hook-bolts, truss-rods for coaches, wagons, and so forth. On the present bridge-repair programme of the Erie Railroad, it is estimated that the Port Jervis shops will be able to supply from such recovered material 40 per cent. of the steel required. The three shop buildings themselves are built almost entirely from material that has been reclaimed in this way.

The main equipment includes electrically-operated power presses for shearing plates and punching rivet-holes, a steam-operated plate bending press, and a blacksmith's forge. Among the tools are an Airco Radiograph for cutting automatically to various patterns ; a 3-phase 60-cycle 220-440-volt portable arc-welder ; jacks ranging in capacity from 15 to 100 tons ; a pedestal grinder for sharpening tools and grinding bridge parts to accurate measurements ; and other equipment of the type normally needed for this class of work. A central compressor plant supplies various compressed-air outlets in the three shops and in the yard, and also an adjacent wagon shop.

A feature of interest about the equipment is the extent to which it has been recovered from units discarded by various locomotive and wagon repair shops on the Erie system. The power plate-bending press was built in its entirety from second-hand material, and is actuated by two discarded steam locomotive cylinders. There are a number of hand-operated chain hoists of 1 to 3 tons capacity, as well as a self-propelled 60-ton steam locomotive crane, which can also be used for erection work on site. The portable arc-welder is also available for use on site where suitable current is available. One of the eight gangs responsible for bridge maintenance on the Erie Railroad is stationed permanently at Port Jervis, and consists of foreman, assistant foreman, seven shop-men, and a clerk ; as this gang is composed of experienced bridge men, it can be used for work in the field when necessary.

The programme of work at Port Jervis is settled by the office of the Engineer of Structures at Cleveland, Ohio. The jobs are carried out by numbers, and according to settled priorities, and weekly progress reports are made from the bridge shop to Cleveland. A permanent stock of new plates, angles, and sections is maintained at Port Jervis, and a stock list is kept up to date constantly, both of this material and of the recovered and re-usable material. As soon as second-hand bridge material is received at Port Jervis shop, a report is immediately made to the Cleveland office as to the sound portions of it that are recoverable, and the drawings made by the Cleveland office for forthcoming work indicate specifically where and how such recovered material is to be worked ; this material then disappears automatically from the stock record at Cleveland. Scrap material from cutting up old structures is graded, and sent to the company's reclamation plant for disposal, except punchings from rivet holes, which are found useful for plugging old river-holes, and also, in bulk, for counter-weighing cranes.

As an example of the scale of work done at the Port Jervis shop, a recent maintenance job was the reconditioning of several wrought-iron towers of a viaduct 818 ft. long and 200 ft. high over the Genesee River at Portage, New York State, for which a total of 260 tons of steel was needed. After fabrication by riveting and welding, and painting, the erection was effected by one of the eight Erie bridge gangs. These gangs, which are highly mechanised, are housed in work-trains, and move from point to point as required. Five gangs undertake all classes of repair and erection work ; one, though capable of minor repairs, specialises in painting and waterproofing structures ; the seventh, smaller than the others, is engaged mainly on welding ; and the eighth is stationed normally at Port Jervis. Each gang has its own railcar and trailer, and a 30-cwt. motor lorry is also available when necessary. These arrangements cover a system with a total route length of 2,242 miles. We are indebted to our American contemporary, *Railway Engineering & Maintenance*, for the foregoing particulars.

C.P.R. Mobile Instruction Coach

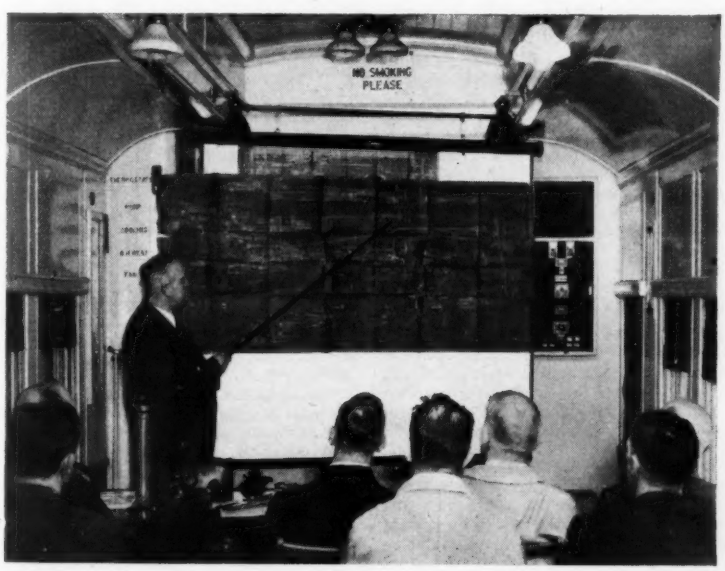
Some 150 locomotive firemen are expected to graduate as drivers on the Eastern Lines of the Canadian Pacific Railway in the annual two-month examination period this year. When qualified, they continue as firemen until the need arises for them to take over as drivers, probably, in the first instance, in yard service.

The candidates have been firemen for from three to five years. They must obtain 80 per cent. marks in stiff final tests, all oral, in the mechanical-instruction coach which travels over all Canadian Pacific lines from Port Arthur to Saint John, N.B., and takes in the Quebec Central and Dominion Atlantic Railways. The vehicle, which was devised by Mr. H. J. Humphrey, Vice-President of the company's Eastern Lines, replaces an air-brake coach in which classes were held previously; in addition, it fulfils duties for which it is specially fitted. Details of the vehicle were worked out by Mr. J. D. Muir, Superintendent of Motive Power & Car Department, Eastern Lines, by whose office the annual examinations are conducted.

The mobile classroom runs for nine months each year. During the seven months which are not taken up by examinations for firemen, it is used in turn as a school, for discussions on train rules, and for practice by train and engine crews. It can accommodate 70 "pupils" at one sitting.

In the qualifying examinations for drivers, memorised answers are not sufficient; the examiners ask further questions fully to test the candidates. The curriculum for the examinations includes instruction in connection with air brakes, train handling, valve gears, superheater equipment, boosters and stokers, injectors, feed-water heaters, headlights, control gauges, water treatment, reverse gears, hydrostatic and mechanical lubricators, steam heat apparatus, ventilating systems, air-conditioning and coach lighting. This year a new course in coal conservation is being held.

All courses are illustrated on a 6-ft. screen by means of a baloptican lamp. A cabinet containing all the standard locomotive gauges, as well as special recorders for test purposes and two air-conditioning panels, form part of the equipment. Living quarters for those in charge take up 19 ft. of the coach's length and include three berths, a shower, toilet facilities, and a small kitchen. The classroom is about 50 ft. long.



Mr. R. F. Thomas, General Air Brake Inspector for Eastern Lines, C.P.R., lecturing to potential locomotive drivers in the mobile instruction coach referred to in the accompanying paragraph

Bengal-Nagpur Railway Co. Ltd.

An extraordinary general meeting of the stockholders of the Bengal-Nagpur Railway Co. Ltd. was held at Winchester House, Old Broad Street, London, E.C.2, on August 29, for the purpose of considering and, if thought fit, passing a resolution approving the terms proposed by the Secretary of State for India for the termination of the company's contract for the working of the Bengal-Nagpur Railway system on September 30, 1944, as set out in the company's circular letter to stockholders, and authorising the board of directors of the company to take any necessary action.

Sir George Godfrey, Chairman and Managing Director, presided, and in the course of his address said:—

The circular letter to stockholders dated August 8 explains fully the reason for calling this meeting.

In the ordinary course of events the company would have continued in management until December 31, 1950, but conditions brought about by the war are not ordinary, and the financial position of India has changed very remarkably during the past four years. Briefly, the change has been brought about through what may be described, I think, as the favourable agreement made by India with the United Kingdom as to sharing war expenses. The result being, as you will have seen in the newspapers, that the Government of India has large sterling credits in this country. It is not surprising therefore that the Government of India under such conditions should desire to use those credits by acquiring valuable assets such as the interests of your company.

Already, within recent months, India has redeemed large blocks of sterling debentures, and has bought out two other important railways, the Madras & Southern Mahratta and the South Indian, in advance of the contract dates.

Your railway is now the only survivor of the many important railway systems of India worked under company control. Whether or not the passing of these railways from company to State management will prove of eventual advantage to India is a matter of opinion, but is not a subject on which I can touch at this meeting. What I can tell you, however, is that the Bengal-Nagpur Railway has always been well managed, well maintained and amply equipped with up-to-date locomotives and rolling stock, and should prove a lucrative acquisition for India.

It is a matter of great regret to me personally, having been connected with the railway for nearly half a century, and to all your directors, to have to consider the idea of parting with the control before the end of our contract, but sentiment cannot be allowed to prevail in an affair of this nature, and we are rightly compelled to take into account your interests as stockholders. There are certain aspects of present day conditions which bear on this, for instance the future political condition of India, the possibility of compulsory acquisition, the uncertainty of trading conditions after the war, and other matters which have all been considered very fully by your directors and have led them to recommend you to accept the offer now made as set out in the letter to stockholders and embodied in the resolution attached to the letter.

Turning to the terms of the letter, I now draw your attention to a few points. The offer is a capital payment of £3,600,000 in exchange for stock of the nominal value of £3,000,000 and the company's contract to be surrendered on and from September 30 next. No new claims are to be made by either party and suitable treatment of the company's staff in India is promised to secure their privileges under the company's rules. This means that the company's servants who have accumulations of leave due to them will not be deprived of that leave if they remain on in State service.

The Government of India will not proceed with what I may describe as its doubtful claim to income tax on the guaranteed interest of past years.

You will note that it is proposed to pay out of the company's capital funds certain compensation, namely:—

To directors, excluding the Government Director, £9,600, representing the value of four years' fees in place of 6¼ years.

To salaried staff of the London organisation, a round figure of £40,000 which includes £5,000 to the Managing Director and £3,000 to the consulting engineers.

I do not doubt that you will regard these proposed payments as moderate and proper.

The negotiations have been prolonged over several months and at one time there was an impossible gap between an offered figure and a figure which your board considered it could place before stockholders, but now we have obtained an offer which we feel we can safely recommend as being fair and advantageous to you.

The resolution was adopted.

Notes and News

Wantage Tramway Charges.—The Minister of War Transport on August 14, 1944, made The Wantage Tramway (Increase of Charges) Order, 1944.

Hurst, Nelson & Co. Ltd.—The directors recommend a dividend on the ordinary shares of 12½ per cent. actual (2s. 6d. a share) for the year to July last, the same as for the previous year. After providing £1,239 (£1,627) for war damage insurance and £4,500 (£2,250) for deferred repairs, the net profits were £32,603 (£32,344).

Municipal Transport Pooling Plan.—Arrangements are reported to have been concluded between the Stalybridge, Hyde, Mossley & Dukinfield Joint Transport Board and the Ashton-under-Lyne Corporation to pool receipts on all routes worked jointly by the two undertakings. It is stated that all mileage actually worked will be related to standard figures and any excess paid for at a flat rate. This pooling arrangement is expected to result in a considerable reduction in statistical work, and in the number of tickets in use.

Silentbloc Limited.—The report for the year ended May 31, 1944, shows that the profit, including a credit of £5,700 in respect of over-provision for taxation, and after providing £6,000 for future taxation, amounted to £25,006 (£19,171), and £7,208 was brought in. The final dividend is 3d. a share (12½ per cent.) less tax, again making, with the interim dividend, 6d. a share (25 per cent.) less tax, for the year, leaving £13,464 to be carried forward. It is proposed to increase the authorised capital from £150,000 to £200,000 by the creation of 500,000 new 2s. ordinary shares. Of these new shares 150,000 will be offered to shareholders at 8s. a share.

L.M.S.R. Extension of Time Application.—The London Midland & Scottish Railway Company is applying to the Minister of War Transport for an Order, under the Special Enactments (Extension of Time) Act, 1940, extending by three years from October 1, 1944, the time now limited by :—(1) The L.M.S.R. (Extension of Time) (No. 3) Order, 1941, for the completion of Works Nos. 1 and 2 at Fleetwood authorised by Section 5 of the London Midland & Scottish Railway Act, 1931 ; (2) by the Order (No. 3) of 1941 for the acquisition of certain lands authorised to be acquired by Section 7 of the L.M.S.R. Act, 1938, at Rugby, Baginton, Hampton-in-Arden, Coventry and Birmingham ; and (3) by Section 6 of the L.M.S.R. Act, 1941, for the acquisition of lands authorised to be acquired by Section 5 of that Act.

Chemin de fer Yverdon-Ste. Croix.—This Swiss railway company returned a net profit for 1934 of fr. 132,700, compared with fr. 121,300 for 1942. A dividend of 3½ per cent. (same) was paid. The sum of fr. 34,700 (fr. 21,300) was carried forward. The number of passengers carried in 1943 was 217,600, compared with 199,600 in the preceding year, and goods traffic amounted to 30,300 *tonnes* (23,500 *tonnes*). Despite the increased traffic the number of trains had to be reduced partly by reason of fuel shortage, and partly because of lack of materials. Passenger receipts increased to fr. 343,350 from fr. 305,724, and goods receipts were fr. 197,783 (fr. 175,840). Total working receipts were fr. 625,340 (fr. 564,014), and working expenditure amounted to fr. 420,187 (fr. 413,280). The comparatively small increase in expenditure was due to reduced purchases of fuel, as many of the services had to be worked with fuel drawn from existing stocks. The line is in course of conversion from steam to electric operation.

Signal and Tablet Inspector Required.—The Sudan Railways require the services of a signal and tablet inspector Details are given in our Official Notices on page 223.

Jungfrau Railway.—Working receipts for 1943 of this Swiss company rose to fr. 939,467 from fr. 801,082 in 1942. Of this total, passenger receipts accounted for fr. 511,584 (fr. 394,955). Working expenditure amounted to fr. 393,575 (fr. 371,822), and the working surplus was fr. 545,892 (fr. 429,260). The company's share capital is fr. 5,125,000. During 1943, 79,441 passengers were carried, compared with 64,785 in 1942.

Road Accidents in June, 1944.—The return issued by the Ministry of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of June last shows 497 deaths (compared with 380 in June, 1943), 2,809 seriously injured (compared with 2,258 in June, 1943), and 7,632 slightly injured (compared with 6,607 in June, 1943).

Mersey Road Tunnel Tolls.—The Queensway road tunnel under the Mersey, which is now ten years old, cost £7,750,000 to build. Some £2,500,000 has been collected in tolls since it was opened, and more than 30,000,000 vehicles have passed through. Recently moves have been made through the Ministry of War Transport to free the tunnel from toll, and to relieve the ratepayers of Liverpool and Birkenhead of the responsibility for maintenance.

P.W.I. Manchester & Liverpool Section.—A Diamond Jubilee meeting of the Manchester & Liverpool Section of the Permanent Way Institution will be held in the engineering lecture theatre of Liverpool University, Brownlow Hill, Liverpool, on September 2, at 2.15 p.m. At the conclusion of business, a lantern lecture on "Experiences and Reminiscences of a District Engineer" will be given by Mr. W. Hepworth, A.M.Inst.C.E., who recently retired from the position of District Engineer, Blackburn, L.M.S.R.

London Escalator Banners.—Large banners reading "Please stand on the right" are to be installed over the escalators at the following London Transport stations: Leicester Square, Marble Arch, Oxford Circus (Central Line), Tottenham Court Road, Holborn, Kings Cross (Northern Line), Paddington, Baker Street, and Piccadilly Circus (Bakerloo and Piccadilly Lines). Similar banner-signs at Waterloo and in the main shafts at Kings Cross and Piccadilly Circus are stated to have been effective in increasing the traffic flow on the escalators during rush periods.

North Central Wagon Co. Ltd.—Net revenue for the year ended June 30 last from rents and other profits, after providing for administration expenses, depreciation, etc., amounted to £86,622 (£79,000) and income from investments was £13,863 (same). After debenture interest, directors' fees, and a tax provision of £39,437 (£38,611) the balance of profit for the year is £22,201 (£21,208), and £22,572 was brought forward. Preference dividend, less tax, again takes £8,125, and the dividend on the paid-up ordinary capital of £225,000 is 3·6d. (2·7d.) per £1 share (3s. paid), absorbing £11,250 (£8,437). Deducting £150 for directors' additional remuneration leaves £25,248 to be carried forward. The increase in net revenue from rents and other profits is due to the substantial additions made to the investment in railway wagons subject to agreements for hire without option of purchase.

Cost-of-Living Index.—The official cost-of-living index figure at August 1 last was 102 points above the level of July, 1914, compared with 101 points a month earlier. In August, 1938, it was 56 points, and in August, 1939, 55 points above July, 1914. In September, 1939, it was 55 points

British and Irish Railway Stocks and Shares

Stocks	Highest 1943	Lowest 1943	Prices August 29, 1944	Rise/Fall
G.W.R.				
Cons. Ord.	65½	57½	58	+ ½
5% Con. Pref. ...	120½	108	117½	+ ½
5% Red. Pref. (1950)	110½	106	105	—
5% Rt. Charge ...	137½	123½	131½	+ ½
5% Cons. Guar. ...	135½	121⅞	129½	+ ½
4% Deb.	118	107½	114½	—
4½% Deb.	119	109⅞	115½	—
4½% Deb.	124½	116	120½	—
5% Deb.	138	127	134½	+ ½
2½% Deb.	77	72½	74½	—
L.M.S.R.				
Ord.	34½	28	30	—
4% Pref. (1923) ...	66½	58	58½	+ ½
4% Pref.	80½	73	75½	—
5% Red. Pref. (1955)	105½	102	103	—
4% Guar.	107	98½	100½	+ ½
4% Deb.	109½	103½	105	—
5% Red. Deb. (1952)	111½	108	109½	—
L.N.E.R.				
5% Pref. Ord. ...	12⅞	7½	8½	— ½
Def. Ord.	5⅝	3⅛	4½	—
4% First Pref. ...	66½	57½	57½	+ ½
4% Second Pref. ...	36½	30½	31	+ ½
5% Red. Pref. (1955)	99⅛	93	99½	—
4% First Guar. ...	102½	94	98	—
4% Second Guar. ...	93½	85⅛	90	—
3% Deb.	86⅛	78⅛	82	—
4% Deb.	109⅞	101⅛	104½	—
5% Red. Deb. (1947)	106½	102	103	—
4½% Sinking Fund Red. Deb.	103	103½	105½	—
SOUTHERN				
Pref. Ord.	80	72½	75½	+
Def. Ord.	26⅛	20½	24	—
5% Pref.	119½	106½	116	—
5% Red. Pref. (1964)	114	108½	113½	—
5% Guar. Pref. ...	136	122	130½	—
5% Red. Guar. Pref. (1957)	117	109½	113½	+ ½
4% Deb.	117½	106	112½	—
5% Deb.	137	126	133½	—
4% Red. Deb. (1962-67)	112	106½	109½	—
4% Red. Deb. (1970-80)	112	107	109½	—
FORTH BRIDGE				
4% Deb.	109	104⅞	104	—
4% Guar.	105	102½	102½	—
L.P.T.B.				
4½% "A"	125½	114	120½	— ½
5% "A"	133⅞	123	130½	—
3% Guar. (1967-72) ...	100½	97	99	—
5% "B"	124	114	121½	+ ½
"C"	72	53	71	—
MERSEY				
Ord.	34½	27	35	—
3% Perp. Pref. ...	68	59½	69	—
4% Perp. Deb. ...	104	102½	103	—
3% Perp. Deb. ...	83	78½	80	—
IRELAND*				
BELFAST & C.D.				
Ord.	9	6	9½	+ ½
G. NORTHERN				
Ord.	24½	16	26	— ⅜
Pref.	—	—	41	— 2
Guar.	—	—	66½	+ ½
Deb.	—	—	85⅛	— ⅛
G. SOUTHERN				
Ord.	30	9½	57	+ 1½
Pref.	30	11	57	+ ½
Guar.	64	26½	72½	— ⅜
Deb.	88⅛	51⅛	94⅛	+ ⅛

* Latest available quotations

OFFICIAL NOTICES

OVERSEAS EMPLOYMENT: SUDAN GOVERNMENT RAILWAYS require the services of a SIGNAL AND TABLET INSPECTOR, preferably unmarried. Candidates should have had workshop and outdoor experience in the maintenance and renewal of signalling installations, tablet, telephone and telegraph instruments. They should also have some knowledge of train control apparatus and be able to prepare signal diagrams, interlocking table and working charts. The candidate, on appointment, will be required to take charge of a district and Sudanese staff under him. He must possess personality and tact, and aptitude for control of staff.

Starting rate of pay £E.324-360 per annum (£E.1 = £1 0s. 6d.), according to age and qualifications, with increases in accordance with Government Scales, viz., £E.324-360-396-432-480-540-600-660-720-780, increases being biennial up to £E.660 and thereafter triennial. First increase subject to passing Arabic examination.

Successful candidates will be appointed on Probationary Contract for two years with a view to permanent pensionable service and will subscribe to the Provident Fund during the probationary period, after which, if accepted to serve towards pension, his contributions will be transferred to the Pension Fund. Free passage on appointment. Strict medical examination. At present there is no income tax in the Sudan.

Written applications (no interviews) giving the following essential details: (1) Full name; (2) Date of Birth; (3) National Service Registration number; (4) Local Office shown on address side of Registration Card N.S.2; (5) Medical grade if known; (6) If discharged from the Forces, particulars of Service number, rank, unit, and reasons for discharge; (7) Industrial training and experience; (8) Name and address of present employers; (9) Details of present work, should be sent to The Secretary, Overseas Manpower Committee (Ref. 957), Ministry of Labour and National Service, Alexandra House, Kingsway, London, W.C.2. Applications will not be acknowledged.

CHIEF DRAUGHTSMAN required by large firm of Locomotive Manufacturers. Previous experience in locomotive design essential, although consideration will be given to applicants who have recently had experience in another industry. Age about 35/45. Applicants should give particulars of their career. Address "1881" Wm. Porteous & Co., Glasgow.

CHIEF ENGINEER required by large firm of locomotive manufacturers. A man with the highest technical qualifications, together with experience of locomotive design and modern methods of production, is required. Age about 35-45. The position will carry considerable responsibility. Salary from £1,200 p.a., according to qualifications and experience. Applicants should write, quoting C.2243XA, to the Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms, which should be returned completed on or before 11th September, 1944.

above July, 1914. It is pointed out by the Treasury that the new index figure means an increase of slightly more than 30 per cent. above the level of September, 1939.

Beira Railway Receipts.—For the month of June, 1944, the approximate gross receipts of the Beira Railway Co. Ltd. were £91,840 and for the nine months ended June 30, 1944, were £724,057 as compared with £66,578 and £605,569 for the corresponding periods in the previous year. The number of miles open was 204.

Rhodesia Railways Earnings.—Approximate gross receipts of the Rhodesia Railways Limited for the month of June, 1944, were £563,048 and for the nine months ended June 30, 1944, were £4,830,977 as compared with £515,664 and £4,445,423 respectively for the corresponding periods in the previous year. The number of miles open was 2,442.

Railway Strike in Ecuador.—Railwaymen throughout Ecuador recently went on strike in support of demands for increases in wages and assistance benefits. It is stated that a number of senior railway officials resigned their posts, and that a cabinet crisis was nearly precipitated. It is understood that a provisional settlement ended the strike, but that the railwaymen may cease work again if their claims are not met.

Ransomes & Rapier New Capital.—In accordance with resolutions passed at an extraordinary general meeting of Ransomes & Rapier Limited the capital of the company is to be increased to £395,000 by the creation of 115,000 "B" preference shares of £1 entitled, after the 6 per cent. preference stock, to a cumulative dividend of 5 per cent. and to priority for capital. These shares are offered for subscription at par to preference and ordinary stockholders registered on July 12, in the proportion of one "B" preference share for every five units of preference or ordinary stock held.

West of India Portuguese Guaranteed Railway Co. Ltd.—The report for the year ended December 31, 1943, shows that gross earnings of the railway and of Mormugao Harbour amounted to Rs. 26,84,014, an increase of Rs. 4,05,571. Railway earnings were higher by Rs. 1,77,497, or 11·45 per cent. Coaching traffic increased by Rs. 66,631, or 26·41 per cent., and goods traffic by Rs. 80,210, or 6·19 per cent. Expenditure on the railway and harbour amounted to Rs. 13,34,521, an increase of Rs. 1,25,910, and the combined net earnings of Rs. 13,49,493 showed an improvement of Rs. 2,79,660. A dividend in respect of the half-year ending December 31, 1943, was paid on January 15, 1944, of 2½ per cent. actual, together with a bonus of ¾ per cent. actual from reserve, making a total of 3¼ per cent. Dividends have been regularly paid at the rate of 5 per cent. per annum on January 15 and July 15 from guaranteed interest. Additional payments, both of ¾ per cent. actual, were made on January 15 and July 15, 1943.

The Pullman Choice.—The Directors of Pullman Inc. have exercised the option given to them by the Court, in deciding to retain their manufacturing business and to withdraw from sleeping car operation. It will be recalled that the Court decreed that the company should not engage in both manufacturing railway rolling stock and also the operation of sleeping cars. The company has until October 5 to submit a plan to the Court for the disposal of its sleeping-car business.

Railbar at Liverpool (Lime Street).—A further addition to the number of railbars now in use at L.M.S R stations was made on August 22, when that at Liverpool (Lime Street) was opened by Mr. Arthur Towle, Controller, L.M.S.R. Hotel Services. He was accompanied by Mr. Geoffrey Towle, his Assistant, Mr. H. E. Pedley, District Passenger Manager, Liverpool, and Mr. A. J. Halton, Stationmaster Liverpool (Lime Street) L.M.S.R.

Rigi Railway.—Working receipts of this Swiss company for 1943 increased to fr. 307,000 from fr. 302,000 in 1942, of which total passenger receipts accounted for fr. 257,900 (fr. 234,700). Working expenditure was fr. 230,000 (fr. 230,100), and the working surplus amounted to fr. 77,000 (fr. 71,900). The profit and loss account closed with a favourable balance of fr. 594, which was carried forward, and, as in 1942, there was no distribution in respect of either the 1928 debenture loan or the fixed banking debts. The number of passengers carried in 1943 was 137,200 (129,200), and goods traffic amounted to 1,900 *tonnes* (2,900 *tonnes*). The line is worked on the rack-rail system.

Troop Train Derailed in U.S.A.—A fine record of safe working over the Louisville & Nashville Railroad of the United States, on which no passenger travelling in a train had been killed since December 20, 1917, was broken on July 6, 1944, when a troop train was derailed a mile south of Highcliff, Tennessee; driver, fireman, and 19 soldiers were killed and about 150 were injured. The line from Cincinnati to Atlanta, on which the accident occurred, is of modern construction; the curve at the site of derailment has check rails, and is protected from rocks falling down the hillside by a detector fence connected directly with the signal system. The country is rugged and lonely, and the possibility of sabotage, consequently, is not excluded; enquiries have been instituted by the Federal Bureau of Investigation and the Army Intelligence authorities.

Contracts and Tenders

Below is a list of orders placed recently by the Egyptian State Railways:—

Yorkshire Copper Works Limited: Solid drawn copper tubes.
J. P. Skinner & Co. Ltd.: Helical springs.
Samuel Osborn & Co. Ltd.: High-speed steel.
Jonas & Colver (Novo) Limited: Cast steel.
R. L. Ross & Co. Ltd.: Valves.

A London office and showrooms have been opened by Fleming, Birkby & Goodall Limited at 90, Regent Street, W.1. The telephone number is Regent 3443, and the telegraphic address is Flemteon, Piccy, London. The company manufactures transmission beltings of various types, canvas hose pipe, industrial overalls, hydraulic leathers, card clothing, leather sundries for the textile trade, and other items. Until the opening of its Regent Street office, the company's interests in London had been represented by agents over a period of 40 years.

L.M.S.R. Signalwoman

An 18½ year old signalwoman at L.M.S.R. signalbox at Countesthorpe (Leicester) who was trained at a special women's class at Leicester where 18 girls, none over 22 years of age, have qualified as signalwomen. The girls have been given practical instruction with specially-equipped block instruments, bells, and indicators, all electrically coupled

Railway Stock Market

Cheerful conditions have prevailed in stock markets, sentiment coming more under the influence of the war news with the liberation of Paris and the remarkable progress of the Allies in France. British Funds continued their upward trend under the head of 3½ per cent. War Loan, and industrial shares showed a moderate although widespread rally. Main feature in the railway section was general improvement in Argentine securities, due to revived hopes of the railways receiving more equitable treatment from the Argentine authorities and the possibility that the position may be clarified earlier than seemed likely a short time ago. Sentiment has also benefited from the big demand for South American produce which can be expected for the peacetime rehabilitation of Europe. It is realised, however, that the railways will be unlikely to benefit materially from any large increase in Argentine trade, unless they are treated fairly by the authorities in that country. The improvement in values has embraced debenture stocks, which in some cases have risen by three points on balance, with demand in evidence for stocks receiving regular interest payments, such at B.A. Gt. Southern 4 per cent. debentures. Experience has shown that the fortunes of the Argentine railways can undergo rapid changes, but it would seem that all points considered, there is little likelihood of the preference and ordinary stocks returning to the regular dividend paying list, unless the railways are treated fairly in the matter of railway charges and exchange rates, particularly the latter. The nitrate agreement between Chile and the U.S.A. tended to attract attention to Antofagasta Railway issues; the ordinary stock was 10¼ and the preference 42½. There was also a better tendency in other securities of South American railways on hopeful views as to the long-term outlook, but movements in prices were mostly small. French railway sterling bonds have again attracted attention at higher prices, sentiment continuing to reflect the was news, although it is realised that a long time may have to elapse before payments can be re-started on these bonds. Canadian Pacifics have been steadier after the setback which followed the decision not to resume payment of an interim dividend.

The tendency in home railway stocks also improved, with earlier small declines attracting better demand in view of the large yields. Buying centred mainly on junior stocks, which showed moderate rallies, and preference stocks were also in greater favour, large yields bringing in rather better demand for L.M.S.R. 1923 preference and L.N.E.R. second preference. On the other hand, Great Western and Southern 5 per cent. preference stocks eased slightly, and would seem undervalued having regard to their good investment merits.

The news that resumption of British coal exports to France are to be resumed was another factor tending to assist sentiment as to home railway stocks. There has been a tendency in markets to give less attention to post-war uncertainties. It is pointed out that the railways always have made it clear that they have every right to standard revenue as defined in the Railways Act, 1921, and that this claim is likely to be emphasised in any discussions as to the future. It is true, of course, that to attain standard revenue a high level of industrial activity would be necessary and that in addition there would have to be an upward adjustment of railway charges to offset the increased cost of materials, wages, etc.

Compared with a week ago, Great Western ordinary rallied from 57¾ to 58¼, although the 5 per cent. preference was half-a-point down at 116½, and the 4 per cent. debentures also fractionally lower at 114. L.M.S.R. ordinary moved better at 30⅜, and the 1923 preference recovered to 58¼ following an earlier decline, although the first preference at 75½ was slightly lower on balance. L.N.E.R. second preference recovered to 31 and was unchanged on balance, as was the first preferencee at 57½. Southern preferred at 75 failed to recover all an earlier decline, and the deferred at 24½, compared with 24⅛ was also below the level of a week ago. Elsewhere, B.A. Gt. Southern ordinary moved up from 11 to 12⅜, and the 4 per cent. debentures from 55½ to 59, reflecting the upswing in Argentine rail securities. San Paulo ordinary was better at 48, as were United of Havana debentures at 28.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1942/3	No. of Weeks	Aggregate traffics to date: Totals 1943/4	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Increase or decrease	Shares or stock	Prices: Highest 1943	Prices: Lowest 1943	Prices: August 29, 1944	Prices: Yield % (See Notes)
South & Central America	Antofagasta (Chili) & Bolivia	834	20.8.44	£ 26,930	– £ 6,160	33	£ 968 620	£ 938,490	+ £ 30,130	Ord. Stk.	15¾	10	11	Nil
	Argentine North Eastern ...	753	19.8.44	15.528	+ 1.032	7	115,026	103 620	+ 11,406	..	7⅜	5	4½	Nil
	Bolivar	174	July, 1944	4,907	– 84	30	36,663	37,405	– 742	6 p.c. Deb.	22½	18	17½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	23½	19	19	Nil
	Buenos Ayres & Pacific ...	2,807	19.8.44	114,720	+ 37,800	7	790,380	586,920	+ 203,460	Ord. Stk.	8½	5½	5½	Nil
	Buenos Ayres Great Southern	5,080	19.8.44	151,440	+ 7,980	7	1,172,520	1,010 220	+ 162,300	Ord. Stk.	17⅛	9½	11½	Nil
	Buenos Ayres Western ...	1,930	19.8.44	58.320	+ 13,500	7	427,860	339,240	+ 88,620	,,	16	9⅛	11½	Nil
	Central Argentine	3,700	19.8.44	162,132	+ 31,602	7	1,196,754	899,970	+ 296,784	,,	10⅛	6½	9½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4½	3	3½	Nil
	Cent. Uruguay of M. Video	972	19.8.44	24,224	– 3.612	7	226,331	221,400	+ 4,931	Ord. Stk.	7⅛	4½	4½	Nil
	Costa Rica	262	May, 1944	26,525	+ 3,664	48	25,679	173 827	+ 77,852	Stk.	16	12½	15	Nil
	Dorada	70	July, 1944	28.381	+ 1,956	30	177.690	146,917	+ 30 773	I Mt. Db.	96	92	96	6½
	Entre Rios	808	19.8.44	19,788	+ 822	7	159,768	141,828	+ 17,940	Ord. Stk.	9	5½	5	Nil
	Great Western of Brazil ...	1,030	19.8.44	18,900	+ 2,600	33	711,700	515.300	+ 196.400	Ord. Sh.	59/9	24/4½	27/7½	Nil
	International of Cl. Amer. ...	794	June, 1944	$528.673	– $63 322	26	$4,200,514	$3,904,639	+ $295,875	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	2⅛	1½	1	Nil
	La Guaira & Caracas... ...	22½	July, 1944	8,510	+ 960	31	54,940	61,140	– 6,200	5 p.c. Deb.	90	80	79	6½
	Leopoldina	1,918	19 8.44	48.5:8	+ 12,731	33	1,505,717	1,125.198	+ 380,519	Ord. Stk.	7⅛	4	5	Nil
	Mexican	483	14 8.44	ps. 421,400	+ ps.29,500	6	ps. 3,002,700	ps. 2,582 800	+ ps. 439,900	Ord. Stk.	1⅞	⅞	⅜	Nil
	Midland Uruguay	319	June, 1944	15,425	+ 21	52	203.234	184.947	+ 18.287	—	—	—	—	—
	Nitrate	382	15 8.44	8,613	+ 1,641	33	119,248	93.250	+ 25.998	Ord. Sh.	83/9	71/3	72/-	£3 9/5
	Paraguay Central	274	18 8.44	$50.407	– $7,453	7	$384,105	$342,220	+ $41,885	Pr. Li. Stk.	75	51½	71	8½
	Peruvian Corporation ...	1,059	July, 1944	118,640	+ 18,622	4	—	—	—	Pref.	17⅞	10½	10½	Nil
	Salvador	100	Apr., 1944	c 152,000	+ c 30,000	43	c 1,310,000	c 1,034,000	+ c 276,000	—	—	—	—	—
	San Paulo	153½	—	—	—	—	—	—	—	Ord. Stk.	71	57	48	£4 3/4
	Taltal	160	July, 1944	1,815	– 1,700	4	1,815	3,515	– 1.700	Ord. Sh.	37/6	20/-	17/6	Nil
	United of Havana	1,301	19.8.44	51,149	+ 3,821	7	338,840	373.582	– 34,742	Ord. Stk.,	8½	3½	3	Nil
	Uruguay Northern	73	June, 1944	1,477	+ 36	52	17,889	17,259	+ 630	—	—	—	—	—
Canada	Canadian Pacific	17,034	21.8.44	1,213,600	+ 55,200	33	39.986,600	36,050.000	+ 3,936,600	Ord. Stk.	18	13⅞	15½	3½
India†	Barsi Light	202	July, 1944	24,878	– 3,817	17	100,365	91,770	+ 8,595	—	—	—	—	—
	Bengal-Nagpur	3,267	June, 1944	978,150	– 63,150	13	3,211,725	3,228,900	– 17,175	Ord. Stk.	104½	101½	120½	£3 6/6
	Madras & Southern Mahratta	2,939	Mar., 1944	358,125	– 7,925	52	10,447,866	8,913,942	+ 1,533,924	—	—	—	—	—
	South Indian	2,349	20.12.43	199,410	+ 24,449	37	5,321,558	4,562,445	+ 750,113	—	—	—	—	—
Various	Egyptian Delta	607	10.7.44	18,735	+ 4,833	14	186,144	138,516	+ 47,628	Prf. Sh.	6⅞	2⅜	4	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	45	32	48	Nil
	Midland of W. Australia ...	277	June, 1944	19,914	– 17.435	52	332,900	392,863	– 59,963	Inc. Deb.	101	93	100½	£4 19/6
	Nigerian	1,900	27.5.44	254,099	– 2.789	12	—	—	—	—	—	—	—	—
	South Africa	13,291	15.7.44	911,388	+ 12.083	15	13,072,996	12,431,530	+ 641,466	—	—	—	—	—
	Victoria	4,774	April, 1944	1,188,999	– 212,162	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current price and are within a fraction of ⅛. Argentine traffics are given in sterling calculated @ 16⅔ pesos to the £

† Receipts are calculated @ 1s. 6d. to the rupee